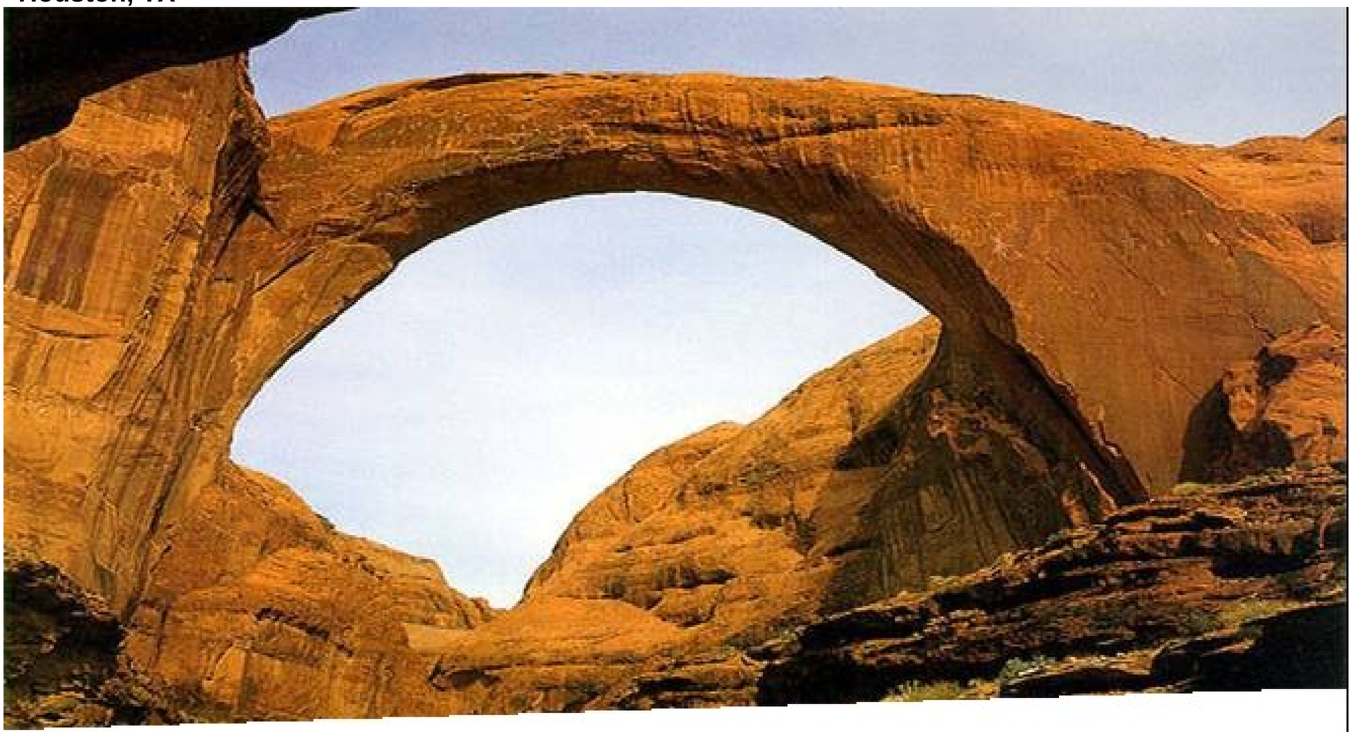
Prepared for:
Sithe Global Power, LLC
Houston, TX



Desert Rock Energy Facility Application for Prevention of Significant Deterioration Permit – Class II Area Modeling Update

ENSR Corporation
June, 2006
Document No.: 10784-001-0004b

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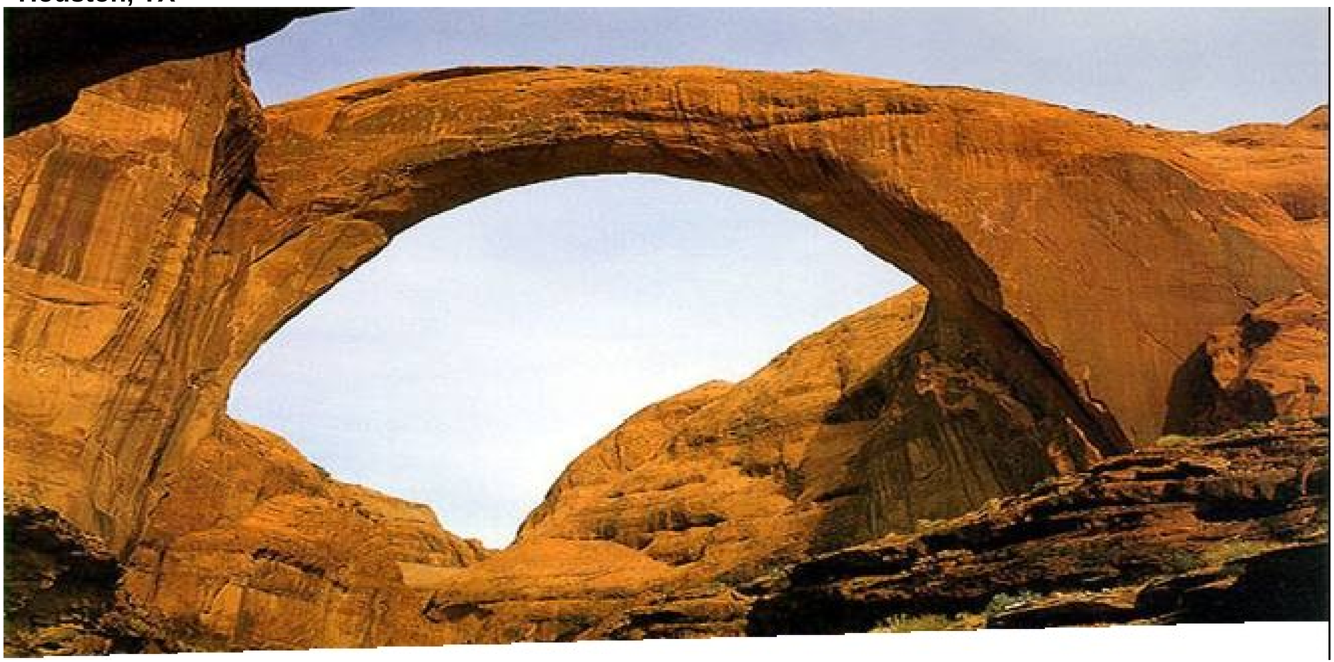

Desert Rock Energy Facility Application for Prevention of Significant Deterioration Permit – Class II Area Modeling Update

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1.0 Introduction

1.1 Executive Summary

This report documents the results of the updated PSD Class II modeling analysis for the proposed Desert Rock Energy Facility project. The modeled project emissions include the main stack emissions that were included in the Class I modeling, as well as emissions from the following sources: auxiliary boilers, emergency generators, fire water pumps, material handling sources, and emissions from road traffic.

The CALPUFF model was used to compute the project impacts in PSD Class II areas, with consistent meteorological data and technical options as were used in the Class I modeling. Modeling domains and receptor networks appropriate for the Class II analysis were employed.

The results of the modeling analysis are summarized as follows.

- The Project impacts are above PSD Class II significance levels for a limited area around the facility (about 11 km for SO2 and 1.7 km for PM10). The project has insignificant impacts for CO and NOx.
- Emissions data provided by the state of New Mexico was used to compile a nearby background source inventory for SO2 and PM10.
- The peak impacts from the facility are located very close to the fenceline (within 1 km in most cases). These impacts are likely due to the emergency generator or auxiliary boilers that do not run continuously.
- The PSD increment consumption due to the facility emissions is well within PSD Class increments. The cumulative modeling analysis shows compliance with PSD Class II increments and the NAAQS.
- The SO2 3-hour and 24-hour impacts are 19% and 12% of the PSD increments and are located between 1.0 km and 1.5 km from the main stack. The PM10 24-hour and annual impacts are 29% and 12% of the PSD increments and are located within 1.0 km of the main stack.
- The SO2 3-hour and 24-hour impacts are 16% and 15% of the NAAQS and are located 11 km from the main stack. Distant impacts from the Four Corners Power Plant and the San Juan Generating Station are likely contributors to this total. The PM10 24-hour and annual impacts are 32% and 39% of the NAAQS and are located within 1 km of the main stack.
- There are no modeled significant impacts from the proposed project in areas beyond the Navajo Nation, including New Mexico lands and the Ute Mountain range to the north.
- Impacts on numerous distant PSD Class II areas (located beyond 50 km) show increment consumption below significance limits. Steag has provided regional haze and deposition results for informational purposes, since PSD Class I limits are not applicable in Class II areas. No further modeling analysis for these distant areas is needed.
- The results of the additional impacts analysis indicate no predicted impacts above EPA screening levels for soils and vegetation

In conclusion, the potential effects on air quality due to emissions from the proposed Desert Rock Energy Facility, in conjunction with the nearby source emissions, are expected to result in predicted concentrations in Class II areas that are in compliance with PSD and NAAQS limits.

1.2 Project Overview

Diné Power Authority (DPA), a Navajo Nation Enterprise, has entered into a development agreement with Sithe Global Power, LLC ("Sithe Global", formerly Steag Power, LLC) to develop an electric power generation facility on Navajo Nation trust land. The Desert Rock Energy Facility, the "Project", will further support the Navajo Nation by utilizing the Navajo Nation coal reserves from the nearby mine operated by BHP Billiton. Sithe Global and DPA have a shared vision to develop an environmentally friendly project that efficiently uses the Navajo resources and brings substantial benefits to the Navajo Nation and surrounding communities.

Sithe Global has taken a holistic approach to the development and design of this facility to incorporate high efficiency with effective emission controls. Sithe Global proposes to use their connections with German experience and proprietary knowledge to design and build a state-of-the-art, mine-mouth coal-fired power plant, and at the same time improve environmental protection, efficiency, and reliability of large coal-fired power plants. The Project will consist of a green-field power plant that will use two supercritical pulverized coal boilers, paired with steam turbines, and will be designed for a total generation capacity of 1,500 MW (gross). The facility will also include three auxiliary boilers, two emergency diesel generators, two diesel firewater pumps, and all of the auxiliary equipment necessary to support the green-field power facility. This equipment will generate substantial power with efficient use of the Navajo Nation coal resource and a minimum of air quality impacts.

The Project will include two dry natural draft Heller cooling tower systems to preserve the critical water resources in the region. Water for plant maintenance will be supplied by the Navajo Nation under a water rights permit. This facility has been designed to optimize the use of water for power generation and to maximize efficiency of the plant operations.

Since the proposed facility will be a "major source" of criteria air pollutants, Sithe Global applied to EPA Region 9 (administrator for the Navajo Nation) for a Prevention of Significant Deterioration (PSD) permit in May, 2004. The permit application was determined to be complete by EPA Region 9 in June, 2004. Most of the comments received on the application involved the Class I area modeling. During this interim period, the project layout and location were adjusted. A revised modeling submittal and supplements that analyzed the project's Class I impacts were submitted in January and March 2006.

This report documents the results of the updated PSD Class II modeling analysis. For completeness and convenience to the reader, this document briefly describes the Project and provides an updated PSD Class II area impact analysis to help complete the review of the previously submitted PSD Permit Application.

Because this Project will be located on the Navajo Nation, and since the Navajo Nation does not yet have PSD delegation, this application is being submitted to the U. S. Environmental Protection Agency (EPA), in Region 9. Sithe Global and DPA continue to work closely with the Navajo Nation Environmental Protection Agency concerning the Project and this application.

1.3 Document Organization

This document provides an updated air quality impact analysis for the proposed project emissions in local and in distant PSD Class II areas. Section 2 provides an overview of the proposed Project and a description of the proposed project emissions. Section 3 discusses the regulatory setting for the Project. Section 4 presents a detailed discussion of the dispersion modeling procedures and the results of the analysis. Section 5 references the regulatory and technical citations used in the document.

Under separate cover, ENSR is providing the modeling files on a DVD. These files include documentation of source information in the form of excel spreadsheets used for the cumulative PSD Class II analyses.

2.0 Proposed Project

Sithe Global, under a development agreement with the Navajo Nation's Diné Power Authority, is proposing to develop a technologically advanced, mine-mouth coal-fired power plant. The power plant will be erected in the Northwestern Area of New Mexico adjacent to Navajo Nation coal reserves at a operating mine of BHP Billiton, one of the largest domestic suppliers of low-sulfur coal. The power plant will be a supercritical pulverized coal type and is designed for a total nominal generation capacity of 1,500 MW (gross), composed of two units of 750 MW (gross) and 683 MW (net) each. Use of a once-through, supercritical steam cycle and other design features will enable this plant to be one of the most efficient dry-cooled steam electric plants ever built in the United States with a net efficiency greater than 40%, based on the lower heating value of the fuel. State-of-the-art emission controls will be used to minimize emissions of potential air pollutants. Water consumption will be minimized by using a Heller system, dry natural draft cooling tower. Solid wastes produced by combustion of the coal and the air pollution control system will be returned to the mine.

2.1 Project Location and General Facility Design

The Desert Rock Energy Facility will be located on a ~580 acre site close to the Navajo Nation coal reserves leased to BHP Billiton in Northwest New Mexico. The site location is ~25 miles Southwest of Farmington, San Juan County, New Mexico in the Navajo Indian Reservation as shown in Figure 2-1. The site can be accessed via Highway 249 from Shiprock, NM and further on Indian Service Routes to be improved for transportation purposes by grading, drainage, and paving.

Figure 2-2 provides a photo of the project site. The project site can be characterized by open prairie in simple terrain within the immediate vicinity of the plant, but with complex terrain in the region that produces previously documented complex wind flows . Figure 2-3 shows the location of the Desert Rock Energy Facility relative to other power plants in the area. The location of the main stack is at 719690E, 4041760N zone 12, NAD 83; this translates into latitude/longitude: 36° 29' 46"N, 108° 32' 50"W. Figure 2-4 shows a plot plan of the facility itself.

Figure 2-1 General View – Farmington Region

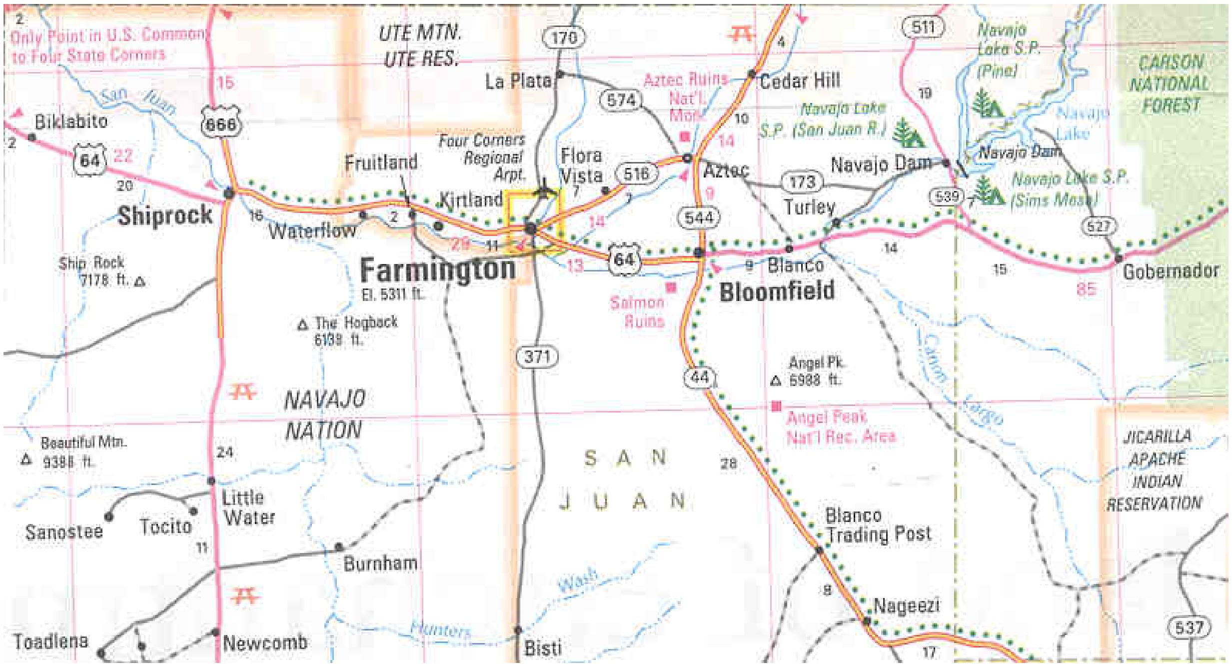
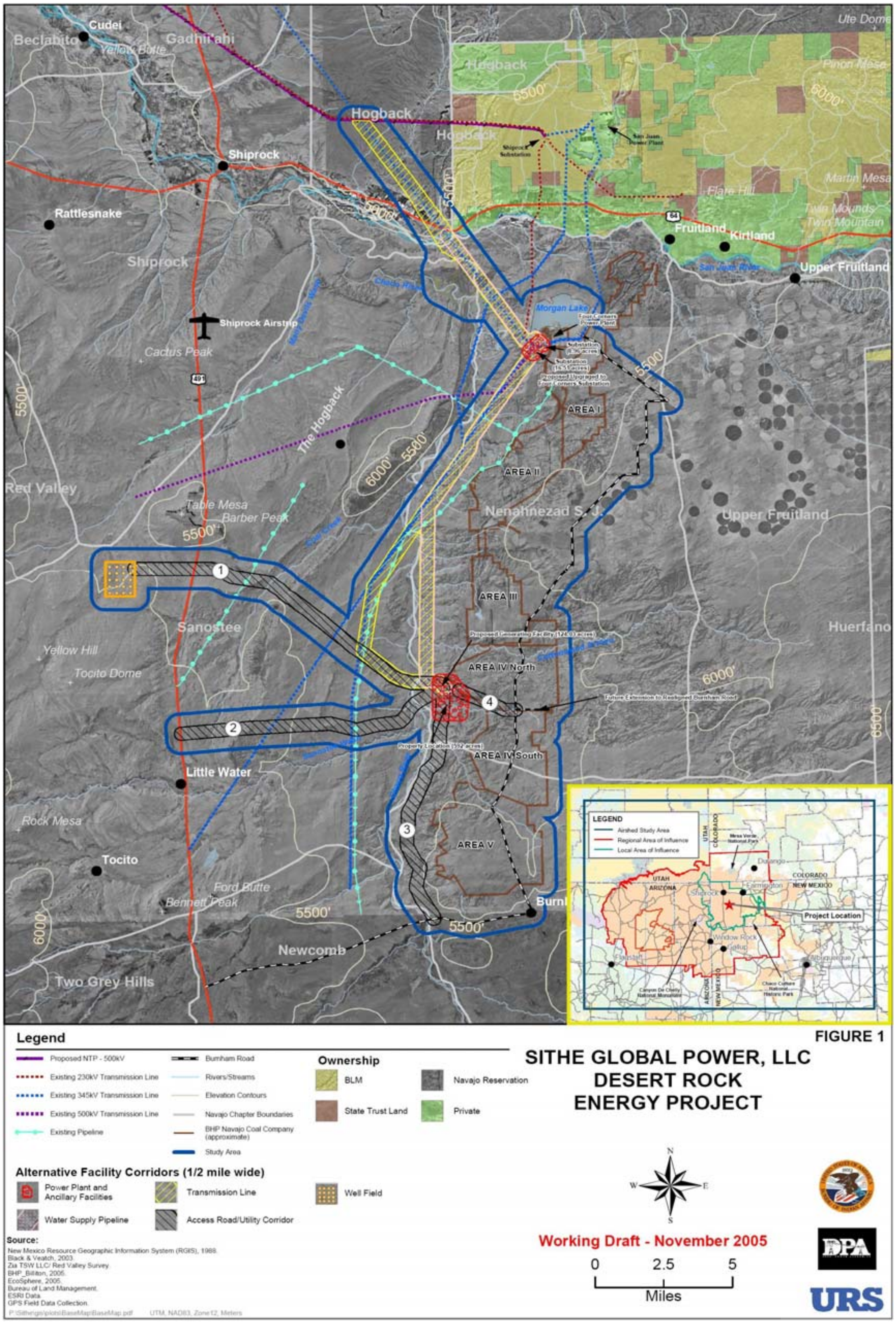


Figure 2-2 Local Terrain in the Power Plant Site Area

Figure 2-3 Location of Desert Rock Energy Facility in Relation to Other Nearby Generating Stations



2.2 Proposed Project Emissions

The power plant will be of the supercritical pulverized coal type and is designed for a total nominal generation capacity of 1,500 MW (gross) divided into two units of 750 MW (gross) and 683 MW (net) each. Each boiler will have a heat input of capacity of approximately 6,800 MMBtu/hr (extreme maximum) and will burn up to 382 tons/hour of coal. In the supercritical cycle, steam is produced at 3,626 psi and 1,112 °F at a rate of 4,636,000 lb/hour. The high-pressure steam is fed through a steam turbine generator to generate electricity and then to a direct contact jet condenser.

2.2.1 Planned Emissions Controls

Air pollution controls for the pulverized coal-fired boilers will consist of the following:

- Low-NO_X burners and selective catalytic reduction (SCR) to control NO_X emissions;
- Low sulfur coal, hydrated lime injection before a fabric filter, and wet limestone flue gas desulfurization to control SO_2 emissions;
- Hydrated lime injection before a fabric filter, and wet limestone flue gas desulfurization to control acid gas emissions including sulfuric acid mist;
- Activated carbon injection (if needed), hydrated lime injection before a fabric filter, and wet limestone flue gas desulfurization to control mercury emissions;
- A fabric filter to control particulate emissions; and
- Good combustion to control CO and VOC emissions.
- A fabric filter to control particulate emissions; and
- Good combustion to control CO and VOC emissions.

Potential criteria pollutant emissions are summarized in Section 2.2.2. Emission rates are based on preliminary plant design data from Steag, Encotec, other vendor data, and EPA emission factors from AP-42.

Emissions of all criteria pollutants from all sources are controlled by applying BACT. Maximum annual criteria pollutant emission rates are summarized in Table 2-1. The two 750 MW SCPC boilers are the primary emission sources whose emissions and stack parameters are summarized in Table 2-2.

Table 2-1 Summary of Criteria Pollutant Maximum Potential Emissions

Pollutant	PC Boilers (TPY)	Auxiliary Boilers (TPY)	Emergency Generators (TPY)	Fire Water Pumps (TPY)	Material Handling (TPY)	Storage Tanks (TPY)	Project PTE (TPY)
CO	5,526	2.55	0.17	0.031	n/a	n/a	5,529
NO_x	3,315	7.13	2.26	0.41	n/a	n/a	3,325
SO_2	3,315	3.61	0.068	0.012	n/a	n/a	3,319
PM(1)	553	1.02	0.083	0.015	18.41	n/a	572
PM_{10} (2)	1,105	1.68	0.077	0.014	15.25	n/a	1,122
VOC	166	0.17	0.11	0.019	n/a	0.14	166
Lead	11.1	0.00064	0.000012	0.0000022	n/a	n/a	11.1
Fluorides	13.3	neg.	neg.	neg.	n/a	n/a	13.3
H_2SO_4	221	0.062	0.0020	0.0004	n/a	n/a	221
Mercury	neg.	neg.	neg.	neg.	n/a	n/a	neg.
Hydrogen Sulfide	neg.	neg.	neg.	neg.	n/a	n/a	neg.
Total Reduced Sulfur	neg.	neg.	neg.	neg.	n/a	n/a	neg.
Reduced Sulfur Compounds	5,526	2.55	0.17	0.031	n/a	n/a	5,529

n/a – not applicable, neg – negligible

(1) PM is defined as filterable particulate matter as measured by EPA Method 5.

(2) PM_{10} is defined as solid particulate matter smaller than 10 micrometers in diameter as measured by EPA Method 201 or 201A plus condensable particulate matter as measured by EPA Method 202. Because PM_{10} includes condensable particulate matter and PM does not include condensable particulate matter, PM_{10} emissions are higher than PM emissions.

2.2.2 Proposed Project's Source Release Characteristics and Emission Rates

2.2.2.1 Main Boilers

The Project's main source of emissions will be the two 750 MW SCPC boilers. Table 2-2 summarizes the Project's main boiler release characteristics and emission rates at 100% and 40% operating load. The two boilers will be exhausted through a dual-flue stack. Therefore, impacts from these boilers were assessed by modeling a single stack with an equivalent stack diameter representative of the two flues.

Table 2-2 Main Boiler Release Characteristics and Emissions for 100% and 40% Operating Loads

<table>
<tr><th colspan="7">Plant Performance</th></tr>
<tr><td colspan="4">100% Load heat input to both boilers (MMBtu/hr)</td><td colspan="3">13,600</td></tr>
<tr><td colspan="4">40% Load heat input to both boilers (MMBtu/hr)</td><td colspan="3">5,440</td></tr>
<tr><td colspan="7"></td></tr>
<tr><th rowspan="2">Emissions</th><th colspan="3">100% Load Emissions</th><th colspan="3">40% Load Emissions</th></tr>
<tr><th colspan="2">lbs/MMBtu</th><th>g/s</th><th colspan="2">lbs/MMBtu</th><th>g/s</th></tr>
<tr><td>SO_2 (1)</td><td colspan="2">0.06</td><td>102.81</td><td colspan="2">0.06</td><td>41.13</td></tr>
<tr><td>NO_X</td><td colspan="2">0.06</td><td>102.81</td><td colspan="2">0.06</td><td>41.13</td></tr>
<tr><td>PM_{10}</td><td colspan="2">0.020</td><td>34.27</td><td colspan="2">0.020</td><td>13.71</td></tr>
<tr><td>CO</td><td colspan="2">0.10</td><td>171.36</td><td colspan="2">0.10</td><td>68.54</td></tr>
<tr><td>Pb</td><td colspan="2">0.0002</td><td>0.34</td><td colspan="2">0.0002</td><td>0.14</td></tr>
<tr><td colspan="7"></td></tr>
<tr><th rowspan="2">Stack Parameters</th><th colspan="3">English</th><th colspan="3">Metric</th></tr>
<tr><th>100% Load</th><th>40% Load</th><th>Units</th><th>100% Load</th><th>40% Load</th><th>Units</th></tr>
<tr><td>Stack gas exit temperature</td><td>122</td><td>122</td><td>Fahrenheit</td><td>323.15</td><td>323.15</td><td>Kelvin</td></tr>
<tr><td>Stack gas exit velocity</td><td>82</td><td>32.8</td><td>ft/sec</td><td>24.99</td><td>10</td><td>m/sec</td></tr>
<tr><td>Stack height</td><td>917</td><td>917</td><td>feet</td><td>279.49</td><td>279.49</td><td>Meters</td></tr>
<tr><td>Stack diameter (2)</td><td>36.8</td><td>36.8</td><td>feet</td><td>11.21</td><td>11.21</td><td>Meters</td></tr>
<tr><td rowspan="2">Model ID (1S12S1) (3)</td><td colspan="2">2,361,181 East</td><td rowspan="2">UTM Zone 12
NAD-1983
(survey feet)</td><td colspan="2">127.306 East</td><td rowspan="2">LCC(4)
(km)</td></tr>
<tr><td colspan="2">13,260,342 North</td><td colspan="2">54.999 North</td></tr>
<tr><td>Base Elevation</td><td colspan="2">5400</td><td>feet</td><td colspan="2">1645.8</td><td>Meters</td></tr>
</table>

(1) 3-hour average SO_2 emission rate is 0.09 lbs/MMBtu. The modeling results have been scaled accordingly.
(2) Effective diameter of two flues = 26 ft. * sqrt(2) = 36.8 ft.
(3) Both boilers exhaust through a common dual flue stack and were modeled as a single source.
(4) The LCC (Lambert Conformal Coordinate) System is based on:
a reference of 36.0N and 110.0W, 0.0 and 0.0 false easting and northing,
30N and 60N two standard parallels, and a WGS-1984 spheroid.

The Project will also include various other types of combustion and fugitive emission sources that will also be considered in the modeling analysis. These sources include the following:

- Cooling Towers
- Auxiliary boilers
- Emergency generators
- Fire water pumps
- Material handling sources
- Emissions from road traffic.

These source categories are separately described below, and emissions details are provided in Appendix A.

2.2.2.2 Cooling Towers

A direct contact jet condenser will be used with a Heller dry cooling tower system. In this cooling system, the process steam from the steam turbine is fed to the condenser and condensed by direct cooling with the cooling water coming from the cooling cycle. The blended cooling water and condensate are collected in the hot-well and extracted by circulating water pumps. Approximately 2% of this flow – corresponding to the steam condensed – is fed to the boiler feed water system by condensate pumps. The major part of the flow is returned to the cooling tower for re-cooling. The cooling duty is performed by the cooling deltas, divided into parallel sectors, where cooling air flow is induced by a natural draft dry cooling tower.

The Heller-type hybrid cooling tower is used to minimize water consumption. When the ambient temperature is below 80°F, the cooling tower operates like a natural draft dry cooling tower. When the temperature exceeds 80°F, the facility has the option of applying water oversprays on the heating surfaces inside of the cooling tower to provide additional cooling. This type of cooling tower has no particulate emissions and therefore stacks will not be included in any modeling analyses.

2.2.2.3 Auxiliary Steam Generators

Three auxiliary steam generators will provide auxiliary steam demand during stand still and start up of the main steam generator. The auxiliary steam generators are of fire-tube/smoke-tube type (package boilers, shell type). Each auxiliary steam generator has a heat input capacity of 86.4 MMBtu/hour. Emission are controlled by only burning low sulfur (0.05% sulfur) distillate oil, Low-NO_x burners, good combustion, and limiting operation to an average of 1,650 hours/year for the three boilers (equivalent to a total maximum annual fuel use in the three boilers of 142,560 MMBtu/year at full load operation). Emissions for the auxiliary steam generators are presented in Table 2-3. The impacts from the three auxiliary boilers were accounted for in the modeling analysis as point sources.

2.2.2.4 Emergency Diesel Generators and Firewater Pumps

There will be two emergency diesel generators with capacities of 1,000 kW and two firewater pumps with capacities of 180 kW. Emission will be controlled by only burning low sulfur (0.05% sulfur) distillate oil, ignition timing retard with turbo-charging and after-cooling, good combustion, and limiting normal operation to a maximum of 100 hours/year per engine. Emissions for the emergency diesel generators and the firewater pumps are provided in Tables 2-4 and 2-5, respectively. The impacts from the two diesel generators and two firewater pumps were accounted for in the modeling analysis as point sources.

2.2.2.5 Material Handling Sources

Coal

Coal is delivered to the site via a conveyor from the nearby mine. The coal is transferred directly from off-site storage piles into the storage bunkers. The coal transfer houses will be equipped with baghouses to control PM_{10} emissions.

Limestone

Ground limestone is delivered to the site by trucks and pneumatically conveyed to a limestone storage silo. The silo will be equipped with a baghouse to control PM_{10} emissions. Limestone will be withdrawn from the bottom of the silo by a rotary vane feeder and transported to the limestone slurry tank where it is mixed with water. The limestone slurry will be used in the wet flue gas desulfurization system.

Ash/Gypsum

Fly ash will be collected by the main fabric filter. The pulverized coal-fired boiler will generate bottom ash. Fly ash and bottom ash will be mixed in an ash silo. Emissions from the ash silo will be controlled by a fabric filter. Gyspum, with a water content in the 10% to 20% range, will be generated by the wet flue gas desulfurization system. The gypsum fly ash and bottom ash will be mixed together and then transported back to the mine by a conveyor.

Fuel Oil

Low sulfur distillate oil (0.05% sulfur) will be used for startup of the pulverized coal-fired boilers and operation of three auxiliary boilers. Oil will be delivered to the site by truck, unloaded at one of two unloading stations and stored in a 1.1 million gallon tank.

Hydrated Lime and Activated Carbon

Hydrated lime and activated carbon, if needed, will be delivered to the site by trucks and pneumatically conveyed to storage silos. The silos will be equipped with a baghouse to control PM_{10} emissions. Hydrated lime will be injected in the duct prior to the fabric filter to control acid gas emissions. Activated carbon will be injected, if necessary, in the duct prior to the fabric filter to control mercury emissions.

Anhydrous Ammonia

Anhydrous ammonia will be delivered to the site by truck for storage in a pressurized tank. There are no air pollutant emissions from the pressurized storage tanks. The anhydrous ammonia system consists of all equipment required to unload, compress, store, transfer, vaporize, dilute, and convey the ammonia/air mixture into the ammonia injection grid upstream of the selective catalytic reduction system.

Road Traffic

All roads on the site property will be paved. Fugitive dust emissions due to the vehicle traffic within the proposed Project's property that are associated with the transport of limestone, ash, gypsum, fuel oil, hydrated lime/activated carbon, and anhydrous ammonia will be accounted for in the modeling analysis.

A tabulation of the modeling parameters for all material handling sources at the proposed facility is provided in Table 2-6 and a summary of the model input is provided in Table 2-7. Table 2-8 contains emission calculations for the paved roads. The material handling sources will be modeled as a mixture of point, area, and volume sources depending on what is most appropriate for the release characteristics. Locations of all the sources from the proposed DREF are shown on Figure 2-4.

Table 2-3 Emission Rates and Stack Parameters for Each (3) Auxiliary Steam Generator

Estimated Annual Hours of Operation:			550	hours/year	
Stack Height:			98	feet	
Stack Diameter:			2.92	Feet	
Stack Flow Rate:			33,038	Cfm	
Average Stack Exit Temperature:			284	^oF	
Stack Exit Velocity:			82	ft/s	
Model IDS: 0M2, 0M3, 0M4					
Pollutant	**Hourly Emissions**			**Annual Emissions**	
	(lb/hr)	**(g/s)**	**(lb/MMBtu)**	**(TPY)**	**(g/s)**
CO	3.09	0.39	0.036	0.85	0.024
NO_x	8.64	1.09	0.1	2.38	0.068
PM_{10} Total	2.04	0.26	0.024	0.56	0.016
SO_2	4.38	0.55	0.051	1.20	0.035
H_2SO_4	0.076	0.010	0.00087	0.021	0.0006
Pb	0.00078	0.00010	0.000009	0.00021	0.00006

Table 2-4 Emission Rates and Stack Parameters for Each (2) Emergency Diesel Generator

Maximum Annual Hours of Operation:			100	hours/year	
Stack Height:			45	Feet	
Stack Diameter:			3	Feet	
Stack Flow Rate:			9058	Cfm	
Stack Gas Exit Temperature:			870	^oF	
Stack Gas Exit Velocity:			21	ft/s	
Model IDs: 0M51, 0M52					
Pollutant	**Hourly Emissions**			**Annual Emissions**	
	(lb/hr)	**(g/hp-hr)**	**(g/s)**	**(TPY)**	**(g/s)**
CO	1.74	0.50	0.22	0.09	2.5E-03
NO_x	22.61	6.50	2.85	1.13	0.033
PM_{10} Total	0.77	0.22	0.10	0.04	1.10E-03
SO_2	0.68	0.19	0.09	0.03	9.72E-04
H_2SO_4	0.02	0.01	0.003	0.001	2.95E-05
Pb	1E-04	3E-05	1.52E-05	6E-06	1.73E-07

Table 2-5 Emission Rates and Stack Parameters for Each Diesel Fire Water Pump

Maximum Annual Hours of Operation:			100	hours/year	
Stack Height:			30	Feet	
Stack Diameter			0.6	Feet	
Stack Flow Rate:			1265	Cfm	
Stack Gas Exit Temperature:			900	^oF	
Stack Gas Exit Velocity:			74	ft/s	
Model IDs: 0M61, 0M62					
Pollutant	**Hourly Emissions**			**Annual Emissions**	
	(lb/hr)	**(g/hp-hr)**	**(g/s)**	**(TPY)**	**(g/s)**
CO	0.31	0.50	0.04	1.57E-02	4.5E-04
NO_x	4.07	6.50	0.51	0.204	5.85E-03
PM_{10} Total	0.12	0.19	0.02	6.9E-03	1.98E-04
SO_2	0.12	0.19	0.02	6.08E-03	1.75E-04
H_2SO_4	0.004	0.01	0.0005	1.84E-04	5.3E-06
Pb	2.E-05	3.E-05	3.E-06	1.08E-06	3.12E-08

Table 2-6 Details of Material Handling Point Sources

Emission Point		UTM Coordinates(1)	Height	Flow Rate Dedusting	Filter Efficiency	Emissions	Stack Velocity	Stack Diameter	Duration	Frequency
		N / E (survey feet)	ft	ft3/hr	%	lb PM10/ hr	ft/min	ft		
0C7	Coal Distribution	N.13260551 E.2361558	50	530,000	99.9%	0.379	3500	1.8	24 hr/day	7 day/week
1C7	Coal Distribution	N.13260816 E.2361351	75	530,000	99.9%	0.379	3500	1.8	24 hr/day	7 day/week
1C9	Coal Bunker	N.13260179 E.2360535	150	700,000	99.9%	0.500	3500	2.1	24 hr/day	7 day/week
1B1 / 1B2	Bottom Ash Silo (Filter Vent and Discharge)	N.13260629 E.2361170	80	10,000	99.9%	0.014	3500	0.2	24 hr/day	7 day/week
1F1 / 1F2	Flyash Silo (Filter Vent and Discharge)	N.13260575 E.2361263	221	180,000	99.9%	0.257	3500	1.0	24 hr/day	7 day/week
1G1 / 1G2	Gypsum Silo (Filter Vent and Discharge)	N.13260630 E.2361220	60	20,000	99.9%	0.029	3500	0.3	24 hr/day	7 day/week
1L1	Quicklime Silo (Vent)	N.13260821 E.2361208	60	200,000	99.9%	0.286	4000	1.0	24 hr/day	7 day/week
2C7	Coal Transfer Bin	N.13260172 E.2361854	75	530,000	99.9%	0.379	3500	1.8	24 hr/day	7 day/week
2C9	Coal Bunker	N.13259914 E.2360742	150	700,000	99.9%	0.500	3500	2.1	24 hr/day	7 day/week
2B1 / 2B2	Bottom Ash Silo (Filter Vent and Discharge)	N.13260364 E.2361377	80	10,000	99.9%	0.014	3500	0.2	24 hr/day	7 day/week
2F1 / 2F2	Flyash Silo (Filter Vent and Discharge)	N.13260309 E.2361471	221	180,000	99.9%	0.257	3500	1.0	24 hr/day	7 day/week
2G1 / 2G2	Gypsum Silo (Filter Vent and Discharge)	N.13260365 E.2361427	60	20,000	99.9%	0.029	3500	0.3	24 hr/day	7 day/week
2L1	Quicklime Silo (Vent)	N.13260252 E.2361652	60	200,000	99.9%	0.286	4000	1.0	24 hr/day	7 day/week

(1) UTM Coordinates are provided in Zone 12, NAD 1983, survey feet.

Table 2-7 Summary of Model Input for Material Handling Sources

Emission Point	Model ID	Emission Type	Stack Coordinates(1)		Stack Height (m)	Stack Base Elevation (m)	Stack Diameter (m)	Stack Velocity (m/s)	Exit Temp (K)	PM_{10} Emissions (g/s)
			LC_X (km)	LC_Y (km)						
0C7	0C7	Point	127.419	55.060	15.24	1645.8	0.55	17.78	293	0.04770
1C7	1C7	Point	127.357	55.139	22.86	1645.8	0.55	17.78	293	0.04770
1C9	1C9	Point	127.113	54.951	45.72	1645.8	0.63	17.78	293	0.06300
1B1 / 1B2	1B1_1B2	Point	127.303	55.084	24.38	1645.8	0.08	17.78	293	0.00180
1F1 / 1F2	1F1_1F2	Point	127.331	55.068	67.36	1645.8	0.32	17.78	293	0.03240
1G1 / 1G2	1G1_1G2	Point	127.318	55.084	18.29	1645.8	0.11	17.78	293	0.00360
1L1	1L1	Point	127.315	55.141	18.29	1645.8	0.31	20.32	293	0.03600
2C7	2C7	Point	127.506	54.946	22.86	1645.8	0.55	17.78	293	0.04770
2C9	2C9	Point	127.174	54.872	45.72	1645.8	0.63	17.78	293	0.06300
2B1 / 2B2	2B1_2B2	Point	127.364	55.005	24.38	1645.8	0.08	17.78	293	0.00180
2F1 / 2F2	2F1_2F2	Point	127.392	54.988	67.36	1645.8	0.32	17.78	293	0.03240
2G1 / 2G2	2G1_2G2	Point	127.379	55.005	18.29	1645.8	0.11	17.78	293	0.00360
2L1	2L1	Point	127.446	54.971	18.29	1645.8	0.31	20.32	293	0.03600

(1) The stack location are provided in a LCC (Lambert Conformal Coordinate) System is based on:
a reference of 36.0N and 110.0W, 0.0 and 0.0 false easting and northing,
30N and 60N two standard parallels, and a WGS-1984 spheroid.

Table 2-8 Paved Road Emissions

Paved Roads emission factor from AP-42, Section 13.2.1: P*aved Roads* (12/03), Equation (2) - corrected to account for annual precipitation

E_U (lb per vehicle mile traveled) =		
((k(sL/2)^0.65*(W/3)^1.5*- C)(1-P/4N))		
where:		
k =	0.016	[Table 13.2.1-1, for PM_{10}]
k =	0.082	[Table 13.2.1-1, for PM]
sL =	0.60	[silt loading (g/m2) normal for low ADT road, AP-42 Table 13.2.1-3 (12/03)]
W=	22.5	[mean vehicle weight(tons) empty truck 10 tons, loaded truck 35 tons]
N =	365	[Number of Days in Averaging Period]
p=	43	[days with >0.01 inches precip./year [15-year (1980-1995) annual mean from Farmington Airport, NM]
PM10 =	0.00047	[Emission factor (lb/VMT) for 1980's vehicle fleet exhaust, brake wear, and tire wear, AP-42 Table 13.2.1-2 (12/03)]
PM =	0.00047	[Emission factor (lb/VMT) for 1980's vehicle fleet exhaust, brake wear, and tire wear, AP-42 Table 13.2.1-2 (12/03)]
U =	0.145	[PM10 lb/VMT]
U =	0.747	[PM lb/VMT]
Trips per day =	40	
Hauling hours per day =	16	hours
Haul road trip =	1.20	miles
VMT (per day) =	48.0	miles
C VMT (annual) =	15,017.1	miles

C

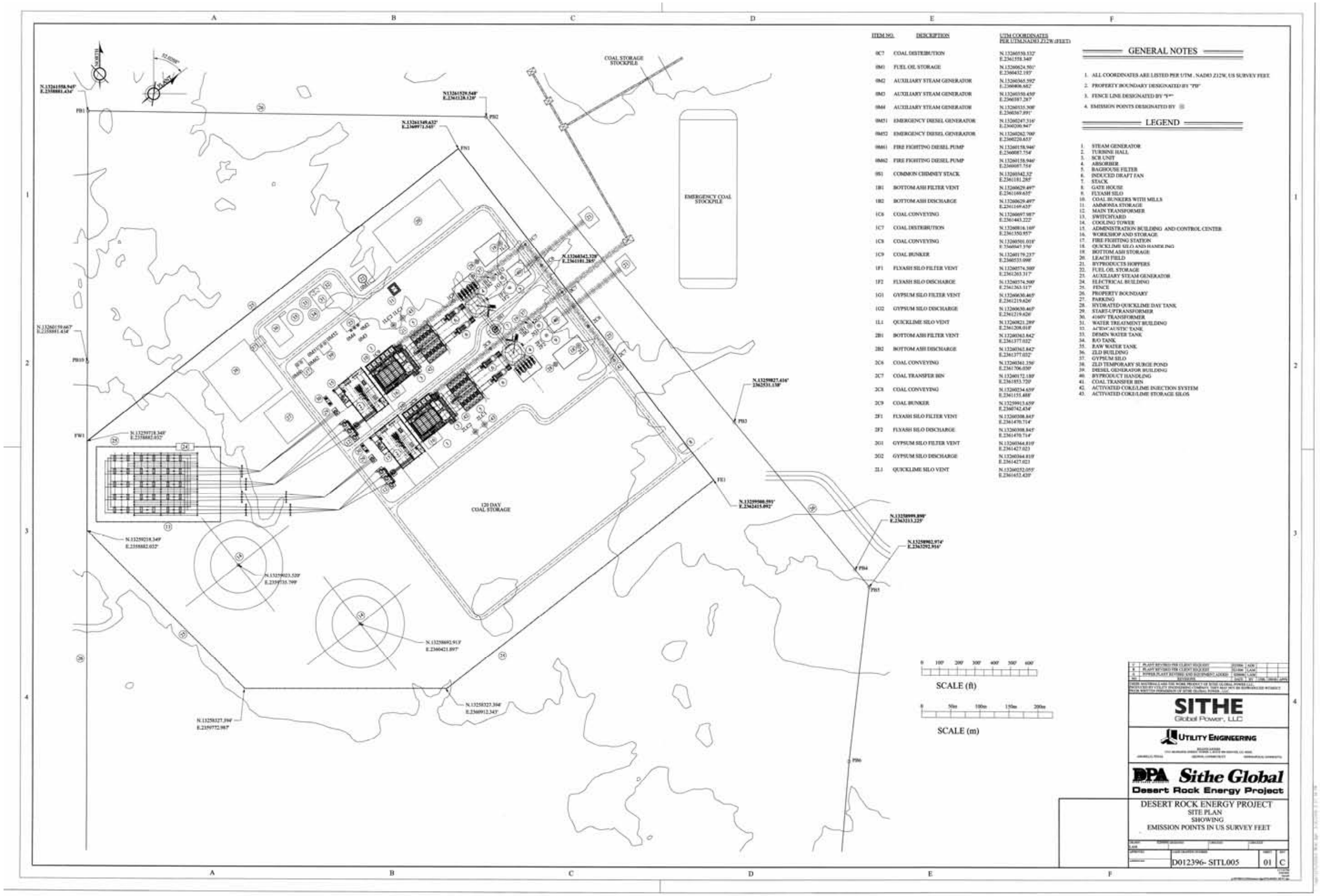
Source E ID E	Source Name	Control Efficiency(2)	Controlled lbs PM_{10} per VMT	Controlled lbs PM per VMT	VMT per Year	VMT per Day	Maximum Emissions (lb PM_{10}/hr)	Annual PM_{10} Emissions (1) (tpy)	Annual PM Emissions (1) (tpy)	Maximum Annual Emissions (lb PM_{10}/hr)	Controlled 24-hr PM_{10} Emissions (g/sec)	Controlled Annual PM_{10} Emissions (g/sec)
ROAD1-9	Paved Haul Road	30%	0.102	0.523	15,017	48	0.31	0.76	3.93	0.17	0.038	0.022

notes:

(1) Annual PM_{10} emission rates are based on annual vehicle miles traveled.

(2) Control efficiency from (*Fugitive Dust Emissions: Water Flushing*), pg 130 of Air & Waste Management Association *Air Pollution Engineering Manual* (2000)

Figure 2-4 Layout of the Proposed DREF



3.0 PSD Class II Regulatory Setting

This Project will be built on Navajo Nation trust land leased from the Navajo Nation through the U.S. Department of Interior. As a federally recognized tribe, the Navajo Reservation is considered sovereign land and is not subject to the regulations of the State of New Mexico. They are subject to the U.S. Environmental Protection Agency (EPA) regulations as are individual States. Air Permitting for this Project is under the jurisdiction of EPA Region 9, since the majority of the Navajo Nation is located in Arizona. All local regulations will be administered by the Navajo Nation EPA (NN EPA), which have been adopted for the most part from the New Mexico Environmental Department (NMED) regulations. The Navajo Nation has not been delegated authority under the Clean Air Act to issue a Prevention of Significant Deterioration permit by EPA, so the PSD permit will be issued by EPA Region 9. DPA and Sithe Global are continuing to coordinate with NN EPA on the Project.

PSD review applies to specific pollutants for which a project is considered major and the project area is designated as attainment or unclassified with respect to the NAAQS. For a new facility to be subject to PSD review, the project's potential to emit (PTE) must exceed the PSD major source thresholds, which are:

- 100 TPY if the source is one of the 28 named source categories, or
- 250 TPY for all other sources.

The Desert Rock Energy Facility is one of the 28 named categories, specifically a fossil fuel fired steam-generating plant with heat input greater than 250 MMBtu/hour. As such, the applicable PSD threshold is 100 TPY. Once it is determined that a pollutant exceeds the PSD major source threshold, additional pollutants will be subject to PSD review if their potential to emit (PTE) exceeds the PSD Significant Emission Rates. Table 3-1 compares the Desert Rock Energy Facility annual PTE with the PSD significant emission rates. As shown in the table, the Desert Rock Energy Facility's PTE is estimated to be greater than the PSD significant emission rates for these PSD pollutants. PSD review and approval will therefore be required for these pollutants.

Table 3-1 Comparison of Desert Rock Energy Facility Annual PTE to the PSD Thresholds

Pollutant	PSD Significant Emission Rate (TPY)	Project PTE(1) (TPY)
CO	100	5,662
NO_X	40	3,405
SO_2	40	3,399
Particulate Matter (TSP/PM)(2)	25	585
PM_{10}(3)	15	1,149
Ozone (VOC)	40	170
Lead	0.6	11.3
Fluorides	3	13.6
Sulfuric Acid Mist (H_2SO_4)	7	226

(1) Assumes 95% annual capacity factor at full load emissions.

(2) PM is defined as filterable particulate matter as measured by EPA Method 5.

(3) PM_{10} is defined as solid particulate matter smaller than 10 micrometers in diameter as measured by EPA Method 201 or 201A plus condensable particulate matter as measured by EPA Method 202. Because PM_{10} includes condensable particulates and PM does not include condensable particulate matter, PM_{10} emissions are higher than PM emissions.

4.0 Short-Range PSD Class II Modeling Procedures and Results

4.1 Overview

This Section addresses PSD requirements related to air quality impact analyses for short-range Class II impacts (<50 km from the project site) and sensitive distant Class II areas (>50 km from project site). In May, 2004, Steag, LLC (now Sithe Global) submitted a PSD permit application to EPA Region 9 along with the associated modeling protocol and modeling analysis for assessing the air quality impacts of the proposed Desert Rock Generating Station. The modeling analysis submitted in May 2004 used the CALPUFF (Scire et al., 2000) model for both short-range and long-range transport modeling. While CALPUFF is the preferred EPA model for long-range transport (distances of at least 50 km), it is also used on a case-by-case basis for local complex winds. The results of a 1982 study focusing upon meteorological conditions in northwestern New Mexico provided evidence that the local flows exhibit complex behavior. Therefore, EPA Region 9 approved the use of the CALPUFF model with a 3-year meteorological database (2001-2003) for evaluating impacts on a consistent basis at all distances.

The two proposed units will exhaust to a common stack which will be built to the Good Engineering Practice (GEP) height of 279.5 meters (917 feet). For modeling impacts at distant sensitive Class II areas, only the emissions from the main stack were modeled, as in the 2004 submittal. For short-range modeling (at distances within 50 km of the project site), along with emissions main boiler at 100% and 40% operating loads, emissions from fugitive sources and other intermittent and low-level combustion sources were also considered, as they were in the 2004 submittal.

4.2 Short-Range PSD Class II Modeling Analysis

As noted in Section 3, the Project is a significant source of emissions for all the criteria pollutants; SO_2, NO_X, PM_{10}, CO, and Pb. As such, a modeling demonstration of the proposed Projects impacts on local air quality is required under PSD. Initial modeling was conducted to determine for which of the criteria pollutants, the Project would have significant impact. The Significant Impacts Levels (SILs) are shown in Table 4-1. For those pollutants predicted to have impacts above their respective SIL, a multi-source modeling analysis was performed to assess impacts within the Significant Impact Area (SIA) on PSD Increment and National Ambient Air Quality values. The following section summarizes the procedures used assess the Project's significance and subsequent multi-source modeling.

Table 4-1 PSD Class II Criteria Pollutant Significant Impact Levels

Pollutant	Averaging Time				
	Annual	24-hour	8-hour	3-hour	1-hour
SO_2	1 $\mu g/m^3$	5 $\mu g/m^3$		25 $\mu g/m^3$	
PM_{10}	1 $\mu g/m^3$	5 $\mu g/m^3$	-	-	-
NO_2	1 $\mu g/m^3$	-	-	-	-
CO	-	-	500 $\mu g/m^3$	-	2000 $\mu g/m^3$
Source: 40CFR 52.21					

4.2.1 Model Selection and Configuration

As mentioned above, CALPUFF was used along with CALMET and three years of prognostic MM5 (2001-2003) to assess impacts on short-range Class II areas due to the complexity of the wind field within the project area. CALPUFF Version 5.724 Level 041013 was used for this analysis. When assessing short-range impacts, CALPUFF was run in a mode that did not consider atmospheric chemical transformations, including deposition. This was done in order to be more consistent with ISC and AERMOD, the guideline models for short-range transport. All other CALPUFF settings were set to the regulatory default values, unless otherwise noted.

The modeling was conducted on a computational domain that extended 55 kilometers in all directions from the Project site location, as shown in Figure 4-1. The domain size of 55 kilometers in all directions was determined based on previous modeling that showed that the maximum extent of the SIA did not extend more than 20 kilometers from the main stack. The 110 km x 110 km km (E-W / N-S) computational grid allows for the use of 1 km grid spacing. The southwest corner of the grid is located at approximately 36.02°N latitude and 109.16°W longitude.

4.2.2 Meteorological Data

Three years (2001-2003) of meteorological data were processed using CALMET. Other than the grid settings and model's resolution of 1 km, the CALMET settings and inputs for the short-range modeling were identical to those used for the Class I modeling. The ENSR Class I modeling report submitted in January 2006 contains a detailed description of the meteorological data development. The extent of the modeling domain used for the short-range Class II modeling is shown in Figure 4-1.

4.2.3 Good Engineering Practice Stack Height Analysis

Federal stack height regulations limit the stack height used in performing dispersion modeling to predict the air quality impact of a source. Sources must be modeled at the actual physical stack height unless that height exceeds the Good Engineering Practice (GEP) stack height. If the physical stack height is less than the formula GEP height, the potential for the source's plume to be affected by aerodynamic wakes created by the building(s) must be evaluated in the dispersion modeling analysis.

A GEP stack height analysis was performed for all point emission sources that are subject to effects of buildings downwash at the proposed facility in accordance with the EPA's "Guideline for Determination of Good Engineering Practice Stack Height" (EPA, 1985). A GEP stack height is defined as the greater of 65 meters (213 feet), measured from the ground elevation of the stack, or the formula height (H_g), as determined from the following equation:

$$H_g = H + 1.5 L$$

where

H is the height of the nearby structure which maximizes H_g, and

L is the lesser dimension (height or projected width) of the building.

Both the height and the width of the building are determined through a vertical cross-section perpendicular to the wind direction. In all instances, the GEP formula height is based upon the highest value of H_g as determined from H and L over all nearby buildings over the entire range of possible wind directions. For the purposes of determining the GEP formula height, only buildings within 5L of the source of interest are considered.

The GEP analysis was conducted with EPA's BPIP program, version 04274. The building-specific wind directions were used as input to CALPUFF. Figure 4-2 shows the buildings and stacks considered in the GEP analysis. The steam generator buildings (Building 1 in Figure 4-2) located west of the main stack were the controlling buildings for the main stack in this analysis. Each of these two buildings is 367 feet tall and 213 long. The BPIP program combines these two buildings as a squat structure and uses the formula $H_g = 2.5 \times H$. In this case the GEP height for the main boilers is 917 feet.

4.2.4 Receptor Grids

The proposed facility's central location is noted by the LCC coordinates of the main stack, which are 54.999 km (north) and 127.306 km (east). The short-range Class II CALPUFF analysis used receptors based on this Lambert Conformal projection and the main stack as the center of the grid (see Figure 4-3). Figure 4-4 shows property fenceline and receptors within a few kilometers. Receptors were placed along the proposed facility fence line spaced at every 50 meters. A multi-layered Cartesian grid combined with a polar grid extends out from the main stack approximately 50 km, which was far enough to resolve the significant impact area (SIA). The Cartesian receptor grid consists of 100-meter spaced receptors beyond the fenceline out to 1.5 km, 250-meter spacing was used beyond 1.5 km out to 4 km, 500-meter spacing was used beyond 4 km out to 8 km, and 1000-meter spacing was used beyond 8 km out to 10 km. Beyond 10 km, polar grid receptors were used. The polar grid receptors were placed along 36 10^{o} radials extending from the central location of the main stacks. Receptors between 10 km and 20 km were placed along each radial every 1000 meters, and from 20 km to 50 km, 5000-meter spacing were used. Additional densely spaced receptors were placed in two specific areas with complex terrain (in the Hogback and Ute Mountains to the north, in the direction where the proposed facility, the Four Corners Power Plant, and the San Juan Generating Station line up). The higher resolution receptors were used in these areas to ensure the resolution of the maximum impacts in these areas. The near-field receptor elevations were developed from 7.5 minute (~30 meter spaced) and 10-meter spaced Digital Elevation Model (DEM) files. The coarse polar grid receptor elevations were developed from 90-meter spaced DEM files.

4.2.5 Significant Impact Level Analysis

The proposed Project's emissions, as described in Section 2, were modeled using CALPUFF to assess for each criteria pollutant, the extent of the SIA. In addition to the main boilers' stack at 100% and 40% operational load, all other plant ancillary sources, including auxiliary boilers (3), diesel generators (2), firewater pumps (2), material handling, and paved roads were also included in the SIL analysis. Conservatively, it was assumed that the auxiliary boilers, diesel generators, and firewater pumps all operated simultaneously. Typically, the auxiliary boilers would not operate while the main boilers are at full load and the diesel generators and firewater pumps would only operate during emergency situations. For short-term averaging periods (less than or equal to 24-hours), maximum hourly emissions were modeled for all sources. Annual impacts were assessed utilizing capacity factors derived from the hour per year utilization noted in Section 2. Maximum modeled short-term and annual impacts of SO_2, NO_X, PM_{10}, and CO from all Project sources including the main boilers at 100% and 40% load were compared to their respective SILs in Table 4-1. However, for the assessment of Pb impacts, only the main boiler stack was assessed because of the rather small amount of emissions from other sources combined with their intermit operation that would only occur while the main boilers were not operating.

Results of the SIL analysis for 100% and 40% load are provided in Tables 4-2 and 4-3 respectively for areas within the Navajo Nation and in Tables 4-4 and 4-5 for areas in New Mexico beyond the Navajo Nation. An overall SIL modeling summary is presented in Table 4-6. The results indicate the following:

- The project emissions have a significant impact for SO_2 and PM_{10}, and an insignificant impact for CO and NO_X. Most of the peak air quality impacts are within 1 kilometer of the plant fenceline, so there is little likelihood for interaction with other sources in the area.

- The peak impacts are below the de minimus PSD monitoring thresholds for NO_2 (14 µg/m^3 annual average), for SO_2 (13 µg/m^3 24-hour average, and for CO (575 µg/m^3 8-hour average). They are slightly above the PM_{10} 24-hour de minimus monitoring threshold of 10 µg/m^3. New Mexico guidance for background PM_{10} concentrations (20 µg/m^3)was used to characterize the existing concentrations in the area.

- Project impacts at both 100% and 40% boiler loads are identical in some cases because the peak impacts are caused by sources other than the main stack emissions.
- The following Significant Impact Area distances resulted:
  - 13.0 km for SO_2, and
  - 2.5 km for PM_{10}.
- The project has an insignificant impact for all pollutants modeled in areas outside the Navajo Nation, including the area to the north in the Ute Mountains.

For those pollutants with maximum modeled impacts above their SIL, a multi-source PSD and NAAQS analysis was undertaken. The procedures and results of the multi-source cumulative impacts analysis can be found in Section 4.2.6.

Table 4-2 Maximum CALPUFF Impacts from Proposed Project @ 100% Load: Navajo Nation

Pollutant	Averaging Period	Maximum Modeled Concentrations								
		2001			2002			2003		
		Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)	Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)	Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)
NO_X	Annual (1)	0.38	1.3	90	0.38	5.3	124	0.56	0.9	302
SO_2	3 hour (2)	271.18	0.2	26	97.91	4.0	228	172.59	0.9	289
	24 hour	23.59	0.2	26	10.42	0.9	141	14.94	0.9	289
	Annual	0.34	1.4	90	0.36	5.3	124	0.41	1.0	307
PM_{10}	24 hour	27.73	0.2	26	11.30	0.6	120	17.09	0.9	289
	Annual	1.75	0.4	325	1.56	0.4	325	1.50	0.4	325
CO	1 hour	1375.70	0.2	26	279.43	4.0	228	888.62	0.9	289
	8 hour (3)	465.16	0.2	26	108.61	4.0	228	296.21	0.9	289
Pb	Quarterly	0.0023	1.3	4	0.0028	1.5	94	0.0023	1.1	276

(1) National default ratio of 0.75 for NO_2/NO_X used.
(2) For 3-hour averages, an SO_2 emission rate of 0.09 lb/MMBtu was assumed to account for short term variability.
(3) A conservatively high 3-hour average is provided for CO.

Table 4-3 Maximum CALPUFF Impacts from Proposed Project @ 40% Load: Navajo Nation

Pollutant	Averaging Period	Maximum Modeled Concentrations								
		2001			2002			2003		
		Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)	Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)	Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)
NO_X	Annual (1)	0.32	0.8	291	0.33	0.9	297	0.42	0.9	302
SO_2	3 hour (2)	271.18	0.2	26	67.81	0.7	281	172.59	0.9	289
	24 hour	23.58	0.2	26	10.42	0.9	141	14.94	0.9	289
	Annual	0.23	3.7	122	0.26	4.0	128	0.27	1.1	304
PM_{10}	24 hour	27.73	0.2	26	11.30	0.6	120	17.09	0.9	289
	Annual	1.73	0.4	325	1.55	0.4	325	1.46	0.4	325
CO	1 hour	1375.70	0.2	26	137.62	1.1	323	888.62	0.9	289
	8 hour (3)	465.16	0.2	26	69.04	1.4	69	296.21	0.9	289
Pb	Quarterly	0.0015	1.2	90	0.0017	1.2	4	0.0013	1.1	290

(1) National default ratio of 0.75 for NO_2/NO_X used.
(2) For 3-hour averages, an SO_2 emission rate of 0.09 lb/MMBtu was assumed to account for short term variability.
(3) A conservatively high 3-hour average is provided for CO.

Table 4-4 Maximum CALPUFF Impacts from Proposed Project @ 100% Load: New Mexico

Pollutant	Averaging Period	Maximum Modeled Concentrations								
		2001			2002			2003		
		Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)	Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)	Conc. ($\mu g/m^3$)	Dist. (km)	Bearing (Deg.)
NO_X	24 hour (1)	1.39	29.3	120	1.40	34.2	130	1.13	24.4	90
	Annual (2)	0.12	29.3	120	0.12	29.3	120	0.12	24.4	90
SO_2	3 hour (3)	7.39	29.3	30	7.47	29.3	120	7.09	29.3	110
	24 hour	0.91	24.4	90	1.09	29.3	10	0.97	29.3	20
	Annual	0.12	29.3	120	0.12	29.3	120	0.12	24.4	90
PM_{10}	24 hour	0.32	29.3	120	0.37	29.3	10	0.33	29.3	20
	Annual	0.04	29.3	120	0.04	29.3	120	0.04	24.4	90
CO	1 hour	14.71	29.3	110	14.30	29.3	120	11.40	29.3	100
	8 hour (3)	8.20	29.3	30	8.06	29.3	120	7.87	29.3	110

(1) A 24-hour State of New Mexico NO_X standard applies for receptors outside of the Navajo Nation.
(2) National default ratio of 0.75 for NO_2/NO_X used.
(3) For 3-hour averages, an SO_2 emission rate of 0.09 lb/MMBtu was assumed to account for short term variability.
(4) A conservatively high 3-hour average is provided for CO.

Table 4-5 Maximum CALPUFF Impacts from Proposed Project @ 40% Load: New Mexico

Pollutant	Averaging Period	Maximum Modeled Concentrations								
		2001			2002			2003		
		Conc. (µg/m^3)	Dist. (km)	Bearing (Deg.)	Conc. (µg/m^3)	Dist. (km)	Bearing (Deg.)	Conc. (µg/m^3)	Dist. (km)	Bearing (Deg.)
NO_X	24 hour (1)	1.24	34.2	130	1.26	34.2	130	0.81	24.4	90
	Annual (2)	0.07	29.3	120	0.07	29.3	120	0.07	24.4	90
SO_2	3 hour (3)	3.94	46.1	83	3.95	29.3	120	3.86	29.3	10
	24 hour	0.56	29.3	120	0.60	39.1	130	0.58	34.2	110
	Annual	0.07	29.3	120	0.06	29.3	120	0.07	24.4	90
PM_{10}	24 hour	0.27	29.3	120	0.23	34.2	130	0.20	34.2	110
	Annual	0.03	29.3	120	0.02	29.3	120	0.03	24.4	90
CO	1 hour	7.13	29.3	110	7.07	29.3	120	6.56	29.3	20
	8 hour (3)	4.38	46.1	83	4.15	29.3	120	4.06	29.3	10

(1) A 24-hour State of New Mexico NO_X standard applies for receptors outside of the Navajo Nation.
(2) National default ratio of 0.75 for NO_2/NO_X used.
(3) For 3-hour averages, an SO_2 emission rate of 0.09 lb/MMBtu was assumed to account for short term variability.
(4) A conservatively high 3-hour average is provided for CO.

Table 4-6 Overall SIL Modeling Summary

Pollutant	Averaging Period	Max Conc. (µg/m^3)	Dist. (km)	Bearing (Deg.)	Load	SIL (µg/m^3)	% of SIL	PSD Class II Incr. (µg/m^3)	% of Incr.	NAAQS/ Other (µg/m^3)	% of Ambient Standard
NO_X	24 hour (1)	1.40	34.2	130.4	100%	N/A	N/A	N/A	N/A	N/A	N/A
	Annual (2)	0.56	0.92	302	100%	1	56%	25	2%	100	1%
SO_2	3 hour (3)	**271.18**	**0.22**	**26**	**100%**	**25**	**1085%**	**512**	**53%**	**1,300**	**21%**
	24 hour	**23.59**	**0.22**	**26**	**100%**	**5**	**472%**	**91**	**26%**	**365**	**6%**
	Annual	0.41	0.98	307	100%	1	41%	20	2%	80	1%
PM_{10}	24 hour	**27.73**	**0.22**	**26**	**100%**	**5**	**555%**	**30**	**92%**	**150**	**18%**
	Annual	**1.75**	**0.44**	**325**	**100%**	**1**	**175%**	**17**	**10%**	**50**	**3%**
CO	1 hour	1375.70	0.22	26	100%	2000	69%	N/A	N/A	40,000	3%
	8 hour (4)	465.16	0.22	26	100%	500	93%	N/A	N/A	1,000	47%
Pb	Quarterly	0.0028	1.47	94	100%	n/a	n/a	n/a	n/a	1.5	0.19%

(1) A 24-hour State of New Mexico NO_X standard applies for receptors outside of the Navajo Nation.
(2) National default ratio of 0.75 for NO_2/NO_X used.
(3) For 3-hour averages, an SO_2 emission rate of 0.09 lb/MMBtu was assumed to account for short-term variability.
(4) A conservatively high 3-hour average is provided for CO.

Figure 4-1 Class II CALPUFF Modeling Domain

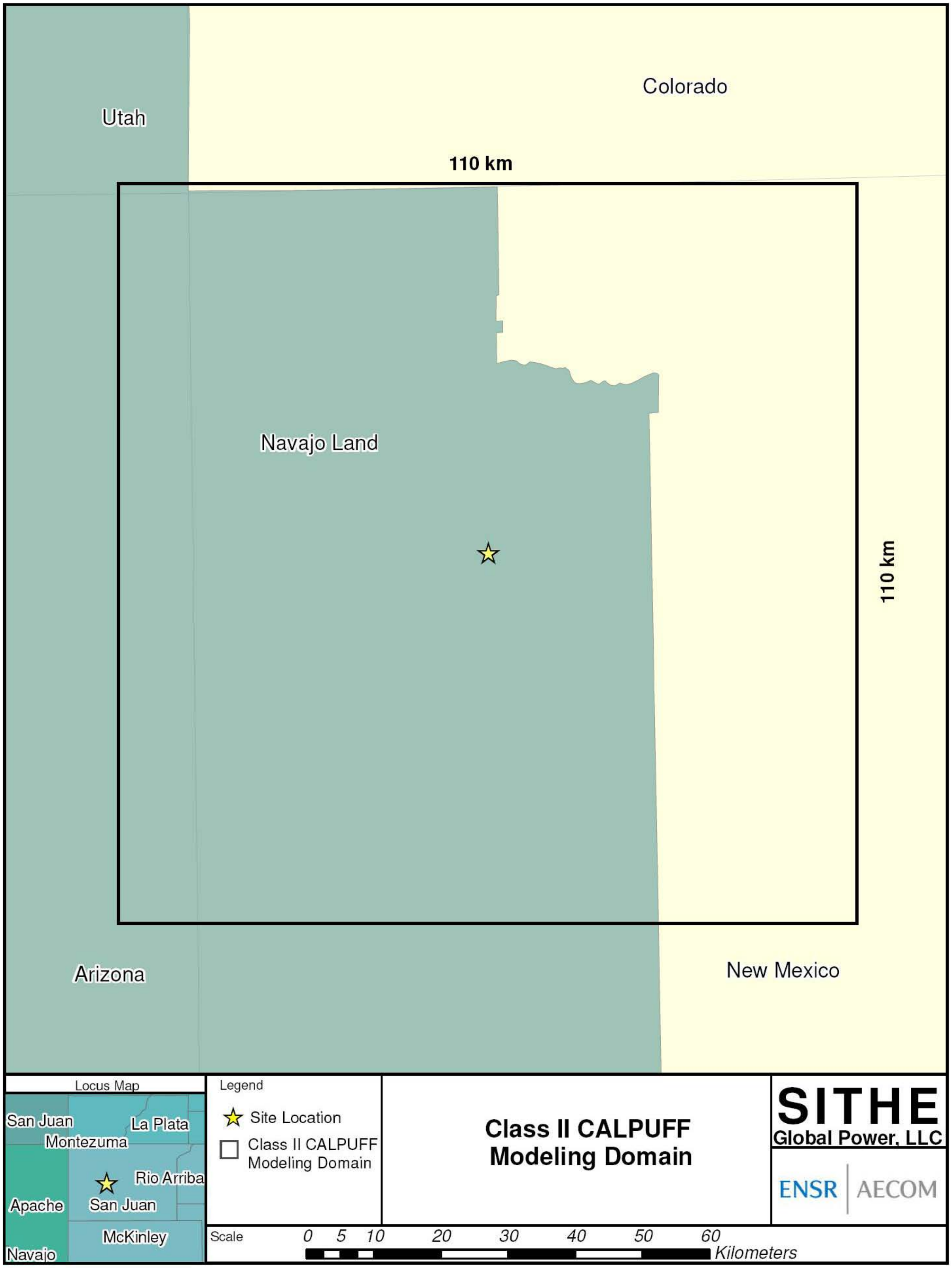


Figure 4-2 Class II Receptor Grid

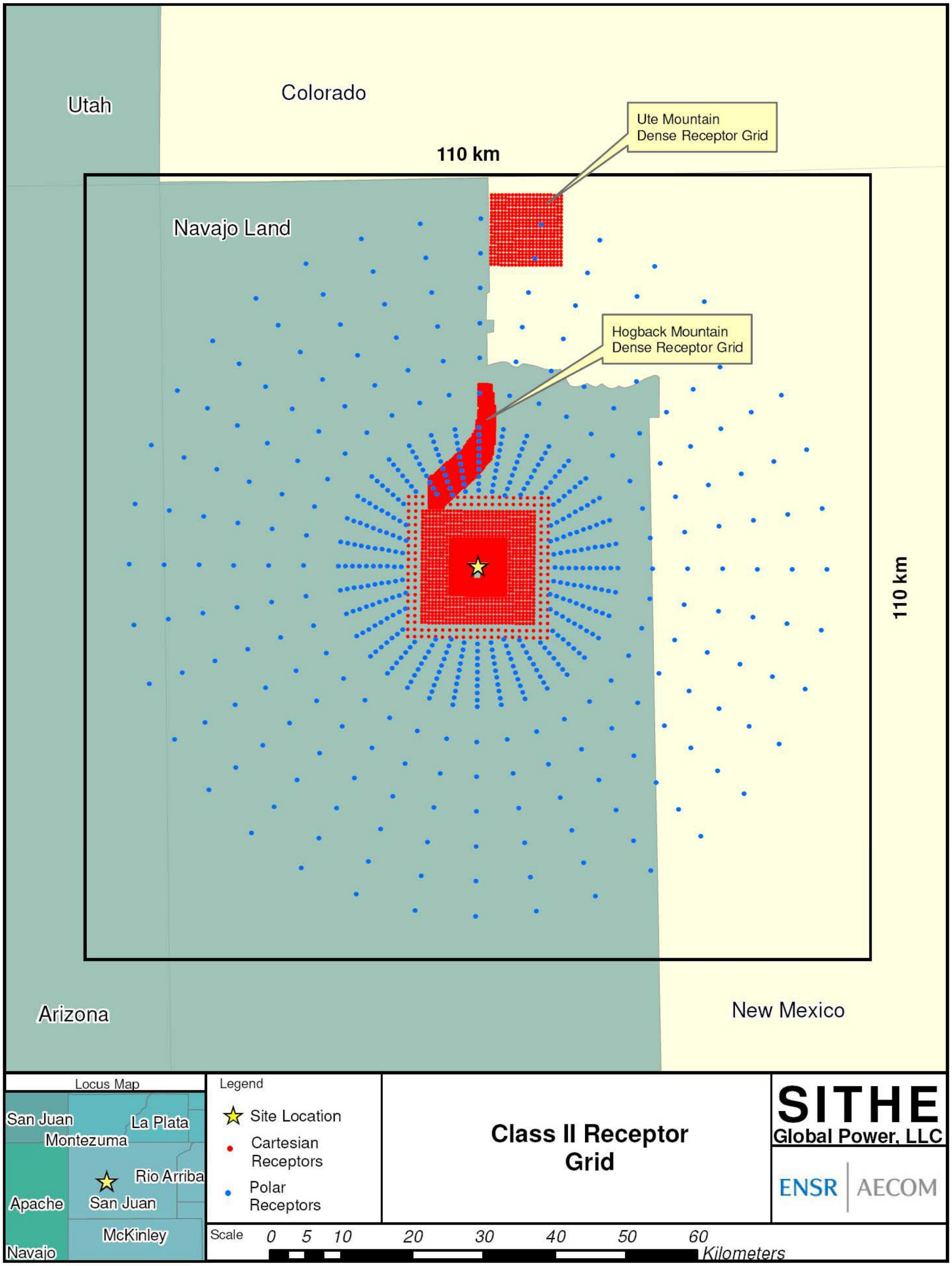


Figure 4-3 Near-field Class II Receptor Grid

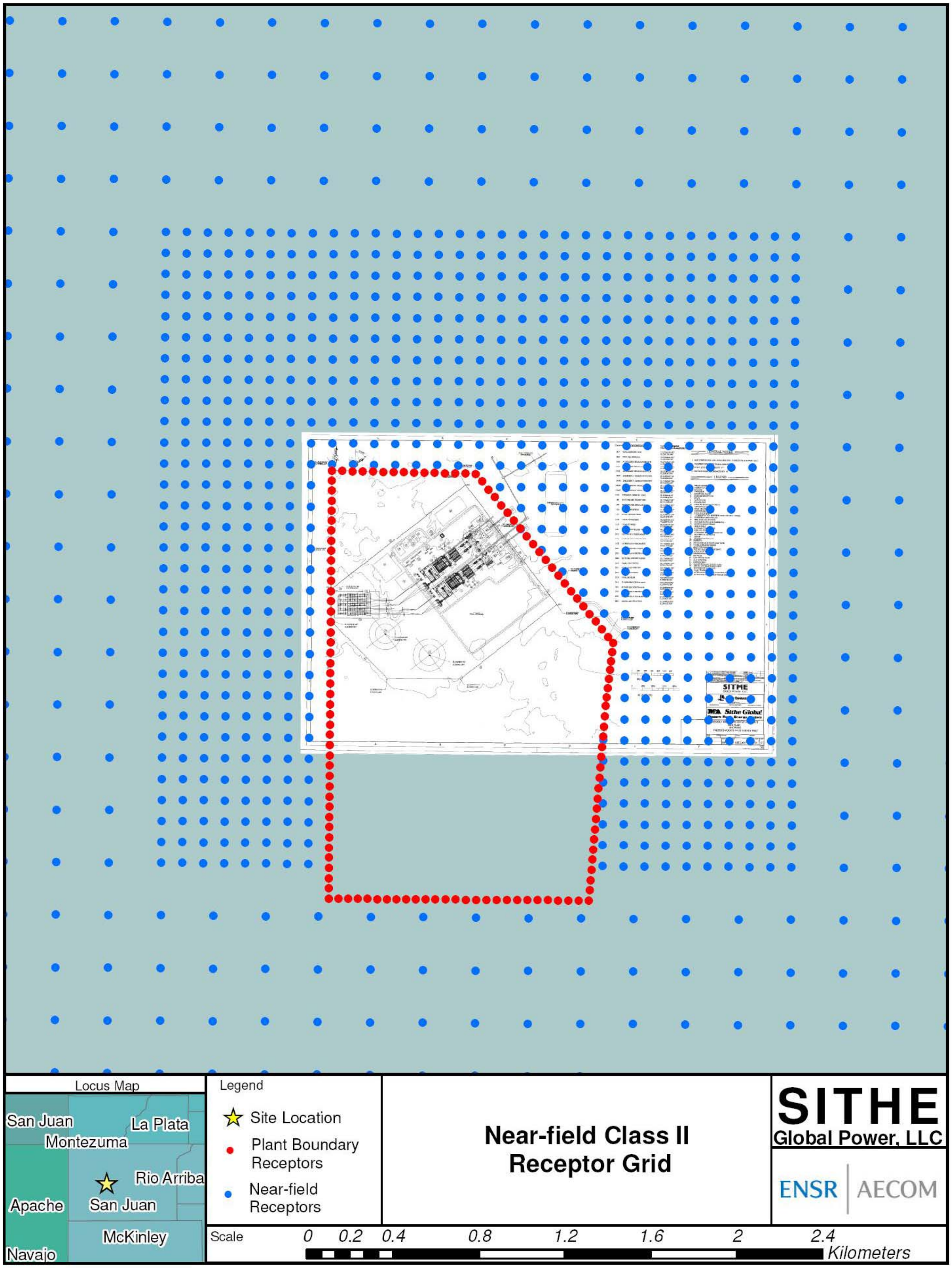


Figure 4-4 GEP Analysis Building Heights and Locations

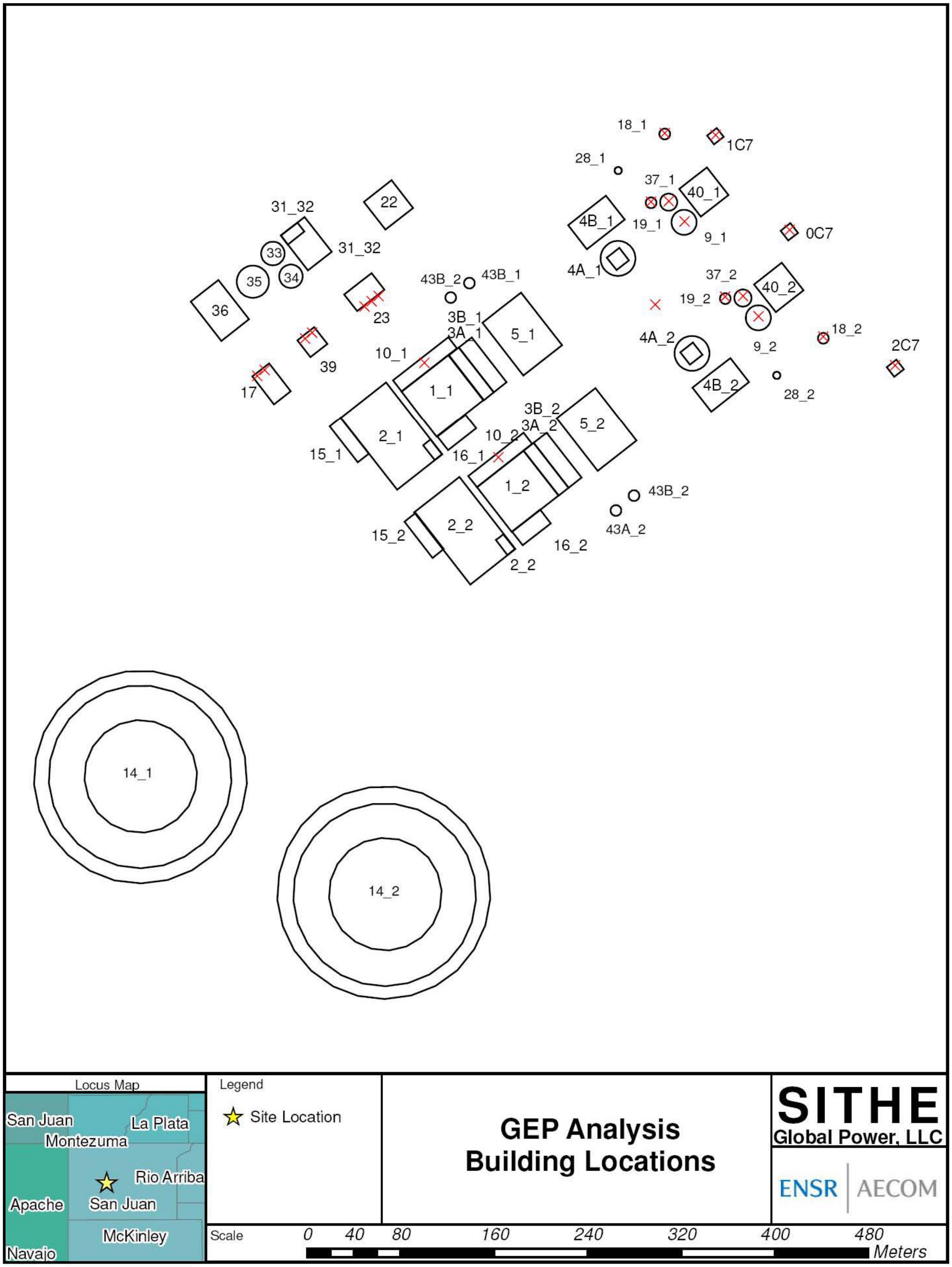
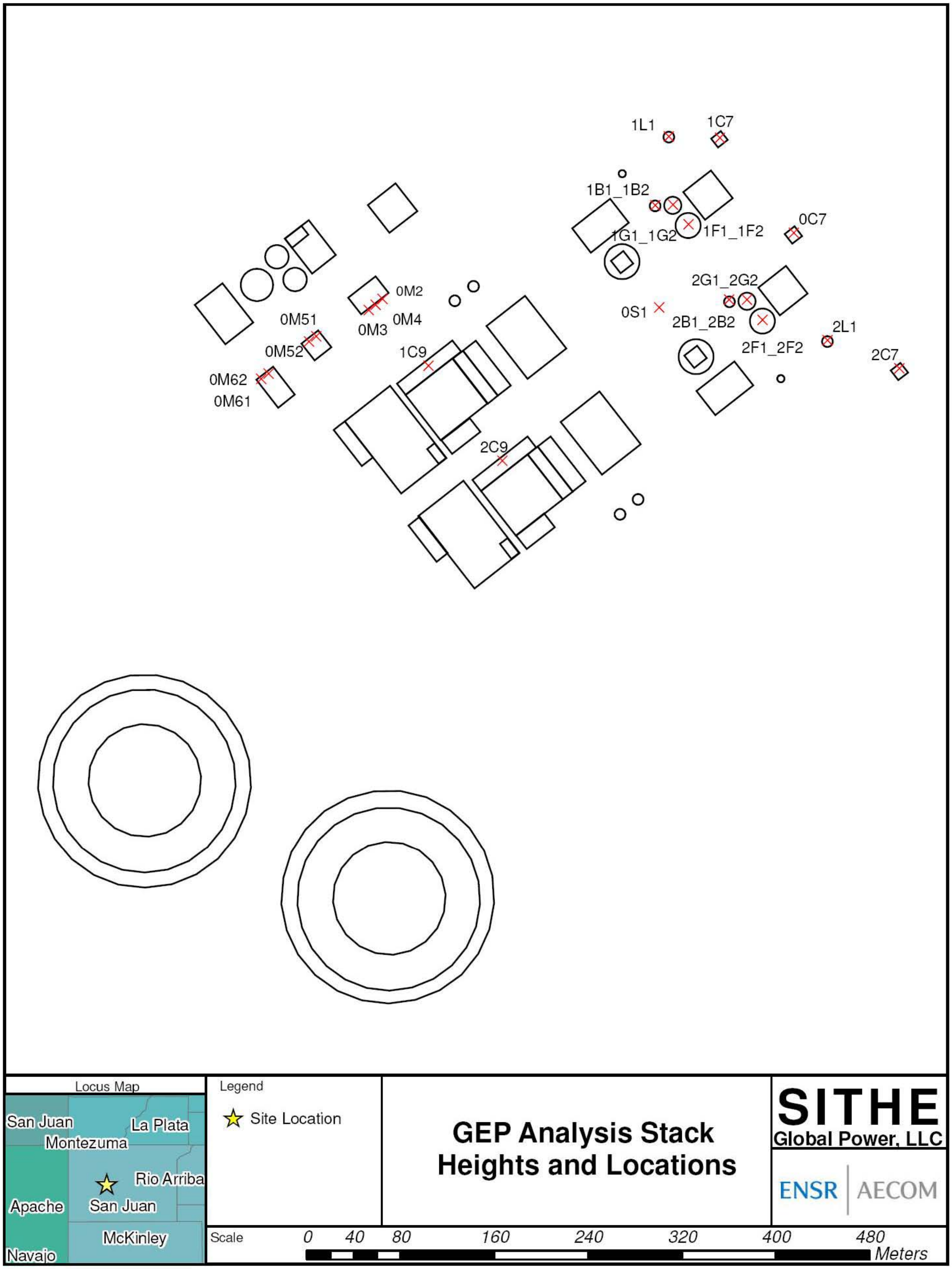


Figure 4-5 GEP Analysis Stack Heights and Locations



4.2.6 Multi-Source PSD and NAAQS Cumulative Impact Analysis

As described above, the Project only impacts were significant in the near-field for SO_2 and PM_{10}. Therefore, a cumulative PSD and NAAQS analysis was performed for those two pollutants.

The source emissions data were obtained from New Mexico's MergeMaster database for an area out to 50 kilometers beyond the PSD Class II pollutant-specific Significant Impact Areas (SIAs) for modeling compliance with the Class II increments and the NAAQS. MergeMaster indicates those sources the consume PSD increment. For the PSD and NAAQS Class II cumulative modeling, all sources, regardless of size, were selected for consideration in the cumulative modeling if they fell within the SIA itself. Beyond the SIA, all SO_2 and PM_{10} sources were modeled except for very small sources with an emission rates in tons per year (TPY) that were smaller than 0.8D for SO_2 and 0.3D for PM_{10}, where D is the distance from the edge of the SIA in kilometers (km). The 0.8D/0.03D relationship is based upon a National Park Service suggestion and was agreed upon as an appropriate screening methodology by EPA Region 9. It is also consistent with the PSD threshold emission rates of 40 or 15 TPY at a distance of 50 km respectively for SO_2 and PM_{10}. The resulting PSD and NAAQS Class II SO_2 and PM_{10} inventories are provided in Appendix A. Also provided in Appendix A are the steps in which certain sources were screened out.

The SO_2 and PM_{10} sources that were included in the analysis are included in Attachment A. The locations of these sources are plotted in Figure 4-6. For the NAAQS analysis, emissions and stack parameters data for all sources was taken directly from New Mexico's MergeMaster database. For the PSD Increment analysis, all increment consuming sources were modeled with emissions and stack parameters from New Mexico's MergeMaster database with the exception of the PSD increment expanding sources from San Juan Generating Station (SJGS) and Four Corners Power Plant (FCPP). The increment expansion at these plants was accounted using emissions and stack parameters similar to those used for the SO_2 Class I PSD Increment analysis. Table 4-7 contains the increment expanding emissions and stack parameters from SJGS and FCPP

Table 4-7 SJGS and FCPP PSD Increment Expanding Emissions and Stack Parameters

Facility Name	X UTM (NAD83 Zone 12) (m)	Y UTM (NAD83 Zone 12) (m)	Base El. (m)	Emissions (g/s)	Stack Height (m)	Stack Temp (K)	Exit Velocity (m/s)	Stack Diameter (m)
San Juan Unit 1	728668	4075889	1610.9	-373.839	121.92	327.59	20.24	6.10
San Juan Unit 2	728668	4075950	1613.2	-348.371	121.92	317.59	18.29	6.10
Four Corners Unit 1	725050	4063201	1627.1	-79.627	76.20	327.59	18.29	5.36
Four Corners Unit 2	725050	4063201	1627.1	-67.202	76.20	327.59	18.29	5.36
Four Corners Unit 3	725050	4063201	1627.1	-62.855	76.20	327.59	31.63	4.36
Four Corners Unit 4	725050	4063201	1627.1	-162.148	115.82	333.15	23.89	8.69
Four Corners Unit 5	725050	4063201	1627.1	-109.897	115.82	333.15	18.29	8.69

In addition to other background sources that were included in the cumulative modeling, emissions from the BHP mine that will feed the Project were included in the cumulative impact assessment. PM_{10} emissions from truck traffic, blasting, grading, scraping, material handling, coal processing (i.e. crushing), and wind erosion were considered from the mine. The emissions from the truck traffic were modeled as a series of segmented area sources. The road segments were designed to be representative of a worst-case location for the active mine strip. The coal transfer points associated with the conveyor transporting the coal from the southern part of the mine to the DREF site where modeled as a series of point sources. The blasting, grading, scraping, and wind erosion were modeled as a large area source selected to be representative of a possible worst-case location for an active strip in the mine. The emissions from coal processing were modeled as volume sources. Table 4-8 shows the parameters used to model the north and south portion of the BHP mine.

Emissions were calculated for the existing mine activities located in the northern par of the mine as shown in Figure 4-7. The impacts from these sources were modeled and included in the NAAQS analysis only. Emissions were also calculated due to the increased activity in the southern portion of the mine due to the coal needs of the DREF. The impacts from these sources were modeled and included in the PSD increment and NAAQS analyses.

The receptors included in the cumulative modeling for SO_2 and PM_{10} increment are those from the original receptor grid used for the SIL analysis except those receptors that fall outside each pollutant's SIA were eliminated. Figure 4-8 shows the receptors that were used for each pollutant's cumulative impact analysis and the extent of the SIA, which as discussed previously is roughly 13 km and 2.5 km for SO_2 and PM_{10}, respectively.

Based on information provided by NMED's modeling guidance, the ambient background for PM10 to be added to the modeled concentrations should be 20 $\mu g/m^3$. The guidance does not suggest an ambient background for SO_2, however 6.2 $\mu g/m^3$ was added to the modeled concentrations. This was based on 2003-2005 monitoring data from 1H San Juan Substation.

The cumulative PSD Class II modeling results are presented in Tables 4-9 and the NAAQS results are presented in Table 4-10. All values are below the applicable PSD Class II Increments and NAAQS limits, and these results show that the project will not have an adverse impact on local SO_2 or PM_{10} air quality. Consistent with guidance received from EPA Region 9, we excluded mine emissions impacts from receptors in the mine itself, but included them for receptors outside the mine. This results in two separate PM_{10} tables.

The locations of these impacts are shown in Figure 4-9. All impacts are within 250-meter spaced receptors except for annual SO_2 increment, which has a negative concentration.

Table 4-8 Modeled Input Parameters used for the BHP Mine

Material Handling													
Source	**Elev**	**Release Ht.**	**Width**	**Distance**	**Initial SigZ**	**PM_{10} Emissions**	**X_vert1**	**X_vert2**	**X_vert3**	**X_vert4**	**Y_vert1**	**Y_vert2**	**Y_vert3**	**Y_vert4**
	(m)	**(m)**	**(km)**	**(km)**	**(m)**	**g/s/m2**	**(LC-km)**	**(LC-km)**	**(LC-km)**	**(LC-km)**	**(LC-km)**	**(LC-km)**	**(LC-km)**	**(LC-km)**
North	1645.8	**10.0**	**0.221**	**4**	**7**	**6.879E-06**	127.863	131.863	131.863	127.863	55.332	55.332	55.111	55.111
South	1645.8	**10.0**	**0.071**	**4.6**	**7**	**9.654E-06**	130.205	130.276	130.276	130.205	53.295	53.295	48.695	48.695

Coal Processing Sources							
Source	**X**	**Y**	**Height**	**Base**	**SigmaY**	**SigmaZ**	**ER**
	(LC-km)	**(LC-km)**	**(m)**	**(m)**	**(m)**	**(m)**	**(g/s)**
TU1	127.4937	55.6195	26.6	1645.8	5.105	12.37	0.0014
CR1	127.4937	55.6195	26.6	1645.8	5.105	12.37	0.0726
CR2	127.4121	55.5853	18.1	1645.8	0.465	8.42	0.0242
TP1	127.3878	55.5743	21.3	1645.8	0.465	9.91	0.0044
TP2	127.3642	55.5633	21.3	1645.8	0.465	9.91	0.0033
TP3	127.4476	55.5182	23.8	1645.8	0.465	11.07	0.0017
BV1	127.4476	55.5182	21.3	1645.8	0.465	9.91	0.0001
BV2	127.4715	55.4756	21.3	1645.8	0.465	9.91	0.0001
BV3	127.4929	55.4320	23.8	1645.8	0.465	11.07	0.0002
BV4	127.5137	55.3897	23.8	1645.8	0.465	11.07	0.0002
TP5	127.3642	55.5633	10.9	1645.8	0.465	5.07	0.0055
TP6	127.3990	55.4948	11.9	1645.8	0.465	5.53	0.0044
TP7	127.4229	55.4505	11.9	1645.8	0.465	5.53	0.0033
TP8	127.4443	55.4063	14.6	1645.8	0.465	6.79	0.0017
BV5	127.3990	55.4948	11.9	1645.8	0.465	5.53	0.0001
BV6	127.4229	55.4505	11.9	1645.8	0.465	5.53	0.0001
BV7	127.4443	55.4063	14.6	1645.8	0.465	6.79	0.0002
BV8	127.4657	55.3590	14.6	1645.8	0.465	6.79	0.0002
TP9	127.6074	55.2139	3.0	1645.8	0.465	0.70	0.0055
TP10	127.5588	55.1882	3.0	1645.8	0.465	0.70	0.0055
TP11	127.6190	55.1909	37.5	1645.8	0.465	17.44	0.0055
TP13	127.5748	55.1657	43.9	1645.8	0.465	20.42	0.0055
TP14	127.5386	55.1449	43.9	1645.8	0.465	20.42	0.0111

South Mine Roads														
Source	Elev	Release Ht.	Width	Distance	Initial SigZ	PM_{10} Emissions	X_vert1	X_vert2	X_vert3	X_vert4	Y_vert1	Y_vert2	Y_vert3	Y_vert4
	(m)	(m)	(m)	(m)	(m)	g/s/m2	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)
Main 1	1645.8	3.5	25	948.4	7	2.768E-06	129.445	129.454	129.430	129.420	53.354	52.427	52.427	53.354
Main2	1645.8	3.5	25	750.8	7	2.444E-06	129.440	128.874	128.858	129.424	52.402	51.934	51.953	52.421
Main2a	1645.8	3.5	25	975.2	7	2.444E-06	128.878	128.804	128.780	128.853	51.942	50.991	50.993	51.944
Main 3	1645.8	3.5	25	1264.9	7	5.907E-06	128.803	128.987	128.963	128.779	50.990	49.768	49.764	50.987
Main 4	1645.8	3.5	25	1225.9	7	4.635E-06	128.983	129.628	129.607	128.962	49.751	48.741	48.728	49.738
Main 5	1645.8	3.5	25	1326.1	7	2.062E-06	129.618	130.528	130.510	129.600	48.725	47.802	47.785	48.708
Ramp 1	1645.8	3.5	25	1015.3	7	2.768E-06	130.429	129.437	129.436	130.428	53.360	53.332	53.357	53.384
Ramp 2	1645.8	3.5	25	821.7	7	2.768E-06	130.461	129.658	129.658	130.460	52.300	52.278	52.302	52.324
Ramp2	1645.8	3.5	25	264.5	7	2.768E-06	129.661	129.432	129.443	129.673	52.276	52.395	52.416	52.297
Ramp 3	1645.8	3.5	25	1747.5	7	2.768E-06	130.495	128.788	128.787	130.495	51.019	50.971	50.996	51.043
Ramp 4	1645.8	3.5	25	1545.8	7	2.768E-06	130.702	129.192	129.191	130.702	49.856	49.814	49.838	49.880
Ramp 4	1645.8	3.5	25	195.1	7	2.768E-06	129.185	129.009	129.000	129.176	49.823	49.750	49.772	49.846
Ramp 5	1645.8	3.5	25	953.3	7	2.768E-06	130.545	129.613	129.612	130.544	48.737	48.711	48.736	48.762

North Mine Roads														
Source	Elev	Release Ht.	Width	Distance	Initial SigZ	PM_{10} Emissions	X_vert1	X_vert2	X_vert3	X_vert4	Y_vert1	Y_vert2	Y_vert3	Y_vert4
	(m)	(m)	(m)	(m)	(m)	g/s/m2	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)
MAIN1	1645.8	3.5	25	717.0	7	1.654E-05	129.867	129.230	129.220	129.857	56.968	56.676	56.698	56.990
WEST1	1645.8	3.5	25	358.1	7	2.990E-06	128.039	127.812	127.830	128.058	54.704	54.969	54.985	54.719
WEST2	1645.8	3.5	25	1157.5	7	2.990E-06	127.819	127.768	127.793	127.844	54.976	56.106	56.107	54.977
WEST3	1645.8	3.5	25	2073.7	7	2.990E-06	127.794	129.638	129.648	127.805	56.107	56.950	56.928	56.085
WEST4	1645.8	3.5	25	240.1	7	2.990E-06	129.632	129.864	129.868	129.636	56.962	56.997	56.973	56.938
WCENTER1	1645.8	3.5	25	2335.0	7	5.690E-06	129.032	128.969	128.993	129.056	54.376	56.657	56.658	54.376
WCENTER2	1645.8	3.5	25	736.3	7	5.690E-06	128.980	129.640	129.650	128.990	56.658	56.945	56.923	56.635
WCENTER3	1645.8	3.5	25	240.1	7	5.690E-06	129.632	129.865	129.868	129.636	56.962	56.993	56.968	56.937

North Mine Roads														
Source	Elev	Release Ht.	Width	Distance	Initial SigZ	PM_{10} Emissions	X_vert1	X_vert2	X_vert3	X_vert4	Y_vert1	Y_vert2	Y_vert3	Y_vert4
	(m)	(m)	(m)	(m)	(m)	g/s/m2	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)
ECENTER1	1645.8	3.5	25	3068.5	7	5.690E-06	131.030	129.878	129.901	131.053	53.965	56.735	56.744	53.975
ECENTER2	1645.8	3.5	25	244.0	7	5.690E-06	129.865	129.892	129.916	129.890	56.729	56.966	56.964	56.727
EAST1	1645.8	3.5	25	407.2	7	2.990E-06	129.891	130.289	130.290	129.893	56.969	56.987	56.962	56.944
EAST2	1645.8	3.5	25	1305.4	7	2.990E-06	130.289	131.231	131.215	130.273	56.977	56.117	56.099	56.959
EAST3	1645.8	3.5	25	490.1	7	2.990E-06	131.227	131.471	131.450	131.206	56.112	55.700	55.688	56.100
EAST4	1645.8	3.5	25	402.4	7	2.990E-06	131.470	131.836	131.827	131.461	55.699	55.556	55.533	55.676
EAST5	1645.8	3.5	25	444.2	7	2.990E-06	131.833	132.149	132.132	131.816	55.549	55.250	55.233	55.531
EAST6	1645.8	3.5	25	258.5	7	2.990E-06	132.147	132.297	132.278	132.127	55.248	55.046	55.031	55.234
EAST7	1645.8	3.5	25	333.1	7	2.990E-06	132.287	132.457	132.437	132.266	55.038	54.761	54.748	55.025
EAST8	1645.8	3.5	25	314.8	7	2.990E-06	132.443	132.674	132.658	132.427	54.753	54.549	54.531	54.734
EAST9	1645.8	3.5	25	603.7	7	2.990E-06	132.667	132.693	132.669	132.642	54.541	53.951	53.950	54.540
PLANT1	1645.8	3.5	25	159.1	7	1.415E-06	127.568	127.569	127.594	127.592	55.889	56.044	56.044	55.889
PLANT2	1645.8	3.5	25	154.6	7	1.415E-06	127.565	127.587	127.612	127.589	56.044	56.194	56.190	56.041
PLANT3	1645.8	3.5	25	42.4	7	1.415E-06	127.588	127.600	127.624	127.611	56.194	56.233	56.226	56.186
PLANT4	1645.8	3.5	25	810.6	7	1.415E-06	127.617	128.338	128.348	127.628	56.223	56.552	56.530	56.201
PLANT5	1645.8	3.5	25	183.4	7	1.415E-06	128.336	128.498	128.509	128.347	56.556	56.633	56.611	56.534
PLANT6	1645.8	3.5	25	201.2	7	1.415E-06	128.497	128.675	128.685	128.508	56.635	56.720	56.698	56.613
PLANT7	1645.8	3.5	25	507.6	7	1.415E-06	128.674	129.121	129.132	128.684	56.721	56.936	56.914	56.699
PLANT8	1645.8	3.5	25	391.8	7	1.415E-06	129.120	129.468	129.478	129.130	56.938	57.097	57.075	56.916
PLANT9	1645.8	3.5	25	212.8	7	1.415E-06	129.467	129.664	129.672	129.475	57.100	57.166	57.143	57.077
PLANT10	1645.8	3.5	25	217.2	7	1.415E-06	129.664	129.870	129.876	129.670	57.167	57.220	57.197	57.143
PLANT11	1645.8	3.5	25	435.1	7	1.415E-06	129.869	130.294	130.295	129.870	57.223	57.235	57.210	57.198
PLANT12	1645.8	3.5	25	39.4	7	1.415E-06	130.294	130.331	130.325	130.288	57.231	57.220	57.197	57.207
PLANT13	1645.8	3.5	25	476.7	7	1.415E-06	130.328	130.655	130.638	130.311	57.213	56.881	56.864	57.196
PLANT14	1645.8	3.5	25	335.9	7	1.415E-06	130.649	130.957	130.948	130.641	56.875	56.761	56.738	56.852

North Mine Roads														
Source	Elev	Release Ht.	Width	Distance	Initial SigZ	PM_{10} Emissions	X_vert1	X_vert2	X_vert3	X_vert4	Y_vert1	Y_vert2	Y_vert3	Y_vert4
	(m)	(m)	(m)	(m)	(m)	g/s/m2	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)	(LC-km)
PLANT15	1645.8	3.5	25	122.5	7	1.415E-06	130.957	131.015	130.993	130.936	56.761	56.656	56.645	56.750
PLANT16	1645.8	3.5	25	457.2	7	1.415E-06	131.011	131.218	131.197	130.990	56.655	56.258	56.247	56.643
PLANT17	1645.8	3.5	25	621.6	7	1.415E-06	131.221	131.557	131.536	131.200	56.258	55.752	55.738	56.245
PLANT18	1645.8	3.5	25	334.4	7	1.415E-06	131.554	131.833	131.820	131.541	55.752	55.582	55.561	55.731
PLANT19	1645.8	3.5	25	29.1	7	1.415E-06	131.831	131.854	131.839	131.816	55.579	55.562	55.542	55.560
PLANT20	1645.8	3.5	25	57.3	7	1.415E-06	131.853	131.897	131.882	131.838	55.560	55.526	55.507	55.541
PLANT22	1645.8	3.5	25	257.4	7	1.415E-06	127.545	127.698	127.679	127.525	55.879	55.680	55.665	55.864
PLANT23	1645.8	3.5	25	277.2	7	1.415E-06	127.696	127.737	127.713	127.672	55.679	55.411	55.407	55.675
PLANT24	1645.8	3.5	25	68.3	7	1.415E-06	127.729	127.792	127.785	127.721	55.410	55.390	55.366	55.386
PLANT25	1645.8	3.5	25	2477.0	7	1.415E-06	127.792	130.212	130.213	127.793	55.389	55.455	55.431	55.364
PLANT26	1645.8	3.5	25	1171.3	7	1.415E-06	130.213	131.357	131.357	130.212	55.440	55.412	55.388	55.416
PLANT27	1645.8	3.5	25	187.0	7	1.415E-06	131.357	131.539	131.536	131.354	55.407	55.386	55.362	55.382
PLANT28	1645.8	3.5	25	303.2	7	1.415E-06	131.539	131.835	131.836	131.539	55.387	55.395	55.371	55.362
PLANT29	1645.8	3.5	25	72.8	7	1.415E-06	131.835	131.886	131.903	131.852	55.394	55.444	55.427	55.377
PLANT30	1645.8	3.5	25	72.6	7	1.415E-06	131.886	131.878	131.902	131.910	55.444	55.514	55.517	55.447

Table 4-9 Cumulative PSD Class II Modeling Results (Summary 2001-2003)

Pollutant	Averaging Period	Modeled Concentration (µg/m³) (1)	Distance (km)	Bearing (Deg.)	PSD Class II Increment (µg/m³)	% of Increment
SO_2	3 Hour (2)	67.30	1.5	102	512	13.1%
	24 Hour	10.75	0.9	141	91	11.8%
	Annual	-0.13	12.7	190	20	-0.7%
PM_{10}(3)	24 Hour	8.47	0.9	137	30	28.2%
	Annual	1.82	0.4	325	17	10.7%
PM_{10}(4)	24 Hour	16.41	2.5	169	30	54.7%
	Annual	3.23	2.4	127	17	19.0%

(1) Second-highest short-term values, highest annual values.

(2) SO_2 3-hour results are based on an emission rate of 0.09 lb/MMBtu from the main stack to account for short-term variability.

(3) These modeled impacts include sources from the mine and are valid for receptors outside the mine property.

(4) These modeled impacts exclude sources from the mine and are valid for receptors within the mine property.

Table 4-10 Cumulative NAAQS Modeling Results (Summary 2001-2003)

Pollutant	Averaging Period	Modeled Concentration (µg/m³)(1)	Regional Background (µg/m³)	Total Conc. (µg/m³)	Distance (km)	Bearing (Deg.)	NAAQS (µg/m³)	% of Ambient Standard
SO_2	3 Hour (2)	403.56	6.2	409.76	12.9	338	1,300	31.5%
	24 Hour	98.31	6.2	104.51	12.9	338	365	28.6%
	Annual	7.21	6.2	13.41	12.9	338	80	16.8%
PM_{10}(3)	24 Hour	8.55	20	28.55	0.9	137	150	19.0%
	Annual	1.95	20	21.95	0.4	325	50	43.9%
PM_{10}(4)	24 Hour	86.53	20	106.53	1.1	121	150	71.0%
	Annual	23.41	20	43.41	1.1	121	50	86.8%

(1) Second-highest short-term values, highest annual values.

(2) SO_2 3-hour results are based on an emission rate of 0.09 lb/MMBtu from the main stack to account for short-term variability.

(3) These modeled impacts include sources from the mine and are valid for receptors outside the mine property.

(4) These modeled impacts exclude sources from the mine and are valid for receptors within the mine property.

Figure 4-6 Location of SO_2 and PM_{10} Sources used for Cumulative Modeling

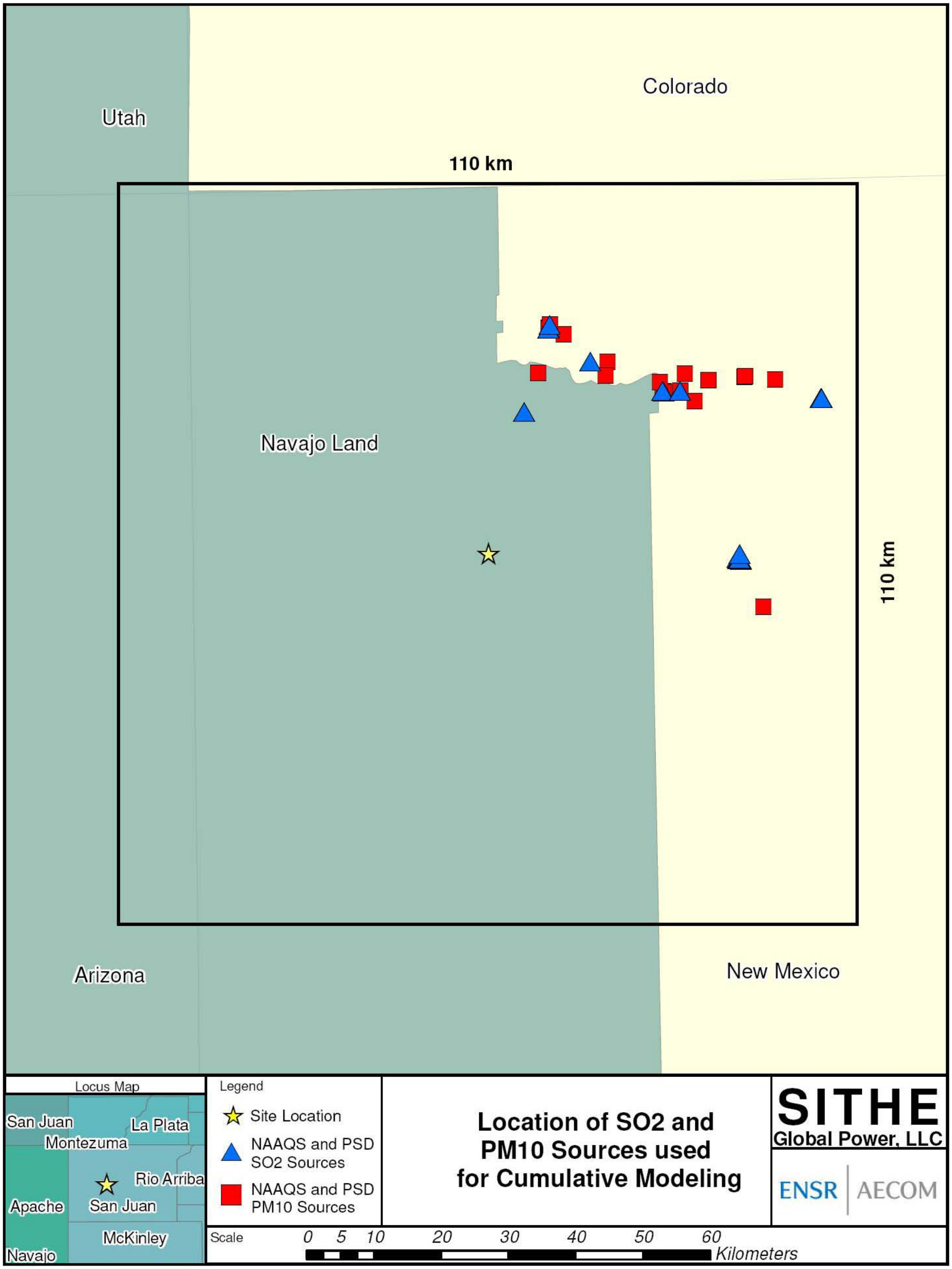


Figure 4-7 Location of Nearby Mine

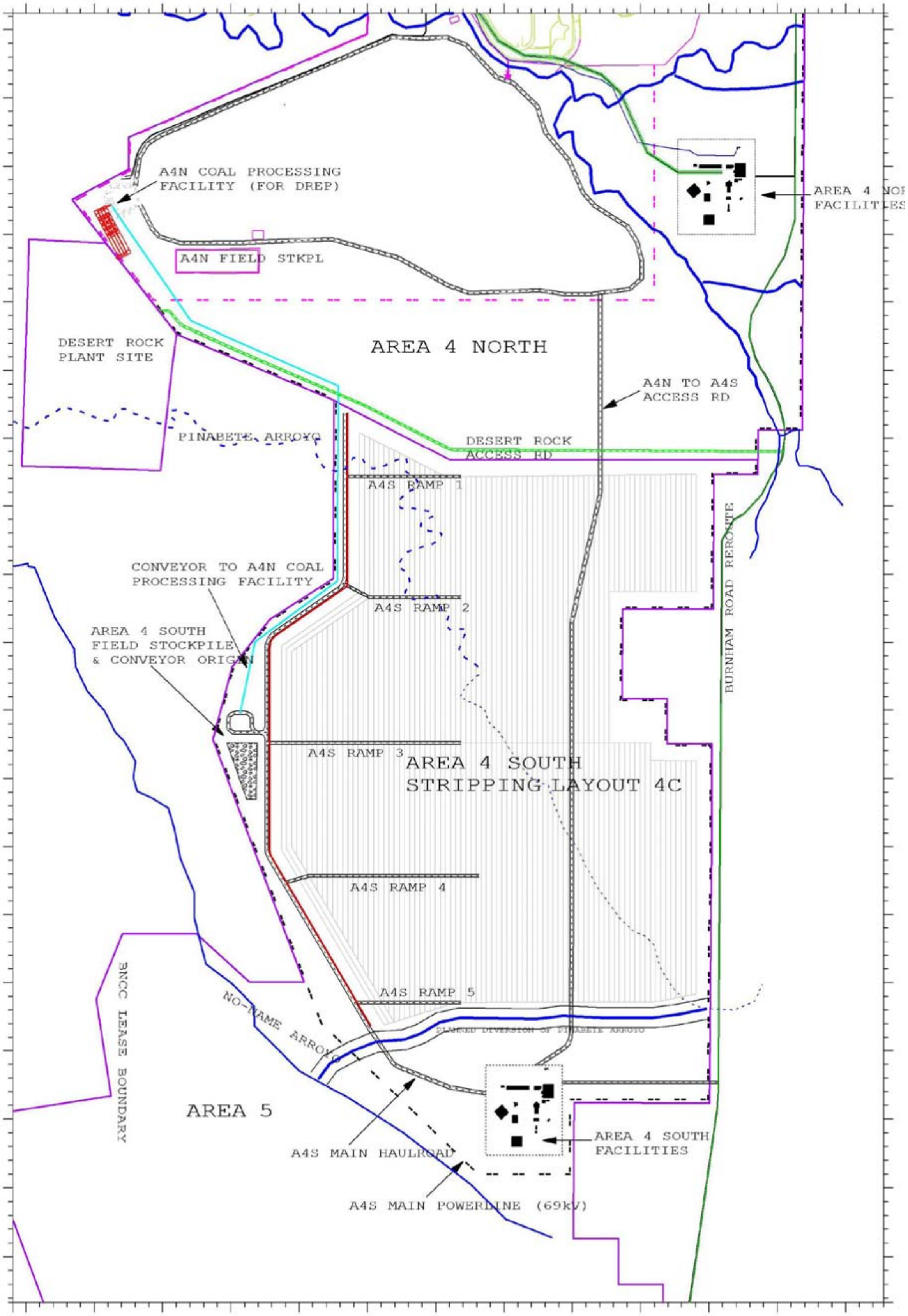


Figure 4-8 Extent of SIA and Receptors used for Cumulative SO_2 and PM_{10} Modeling

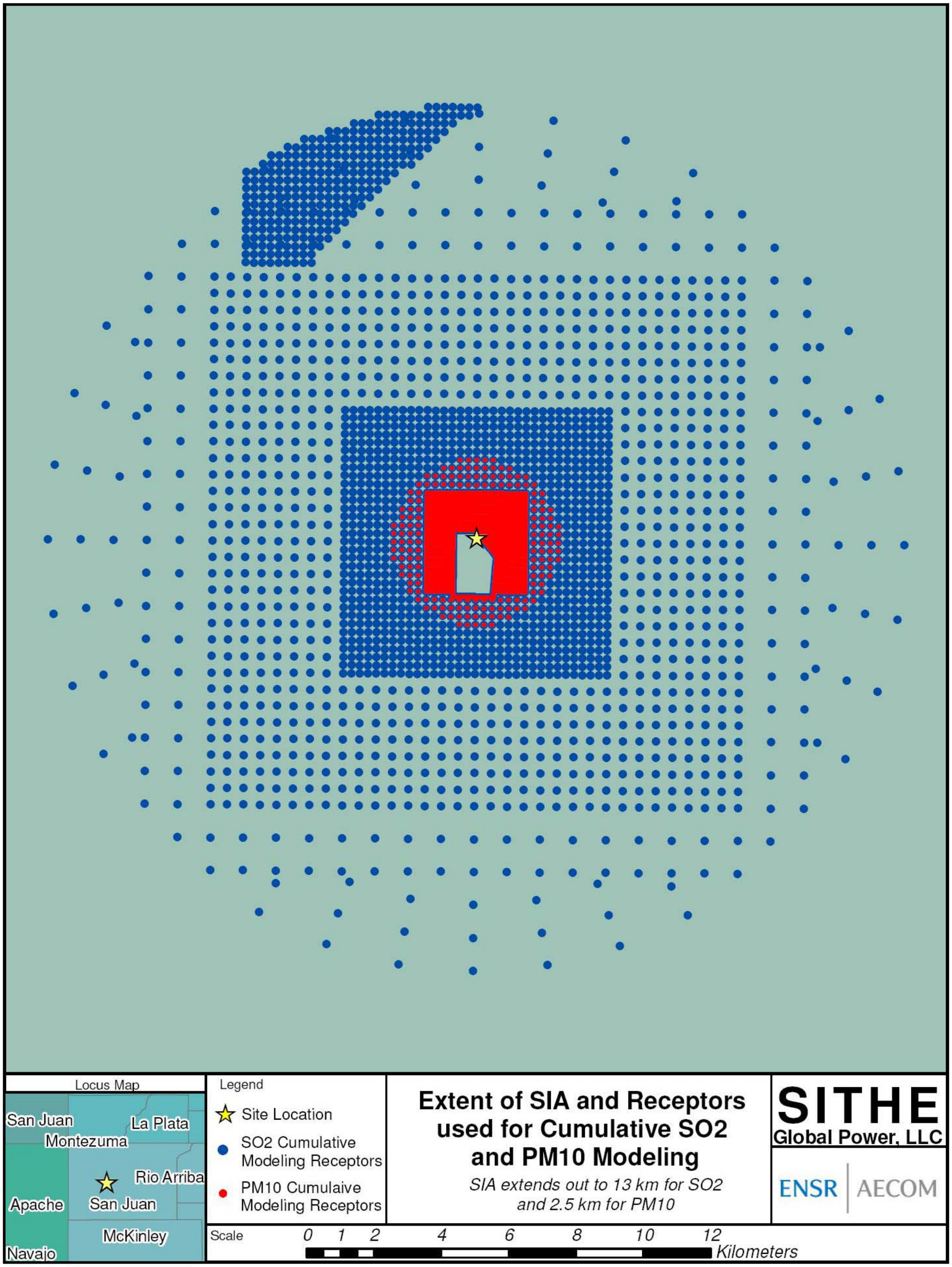
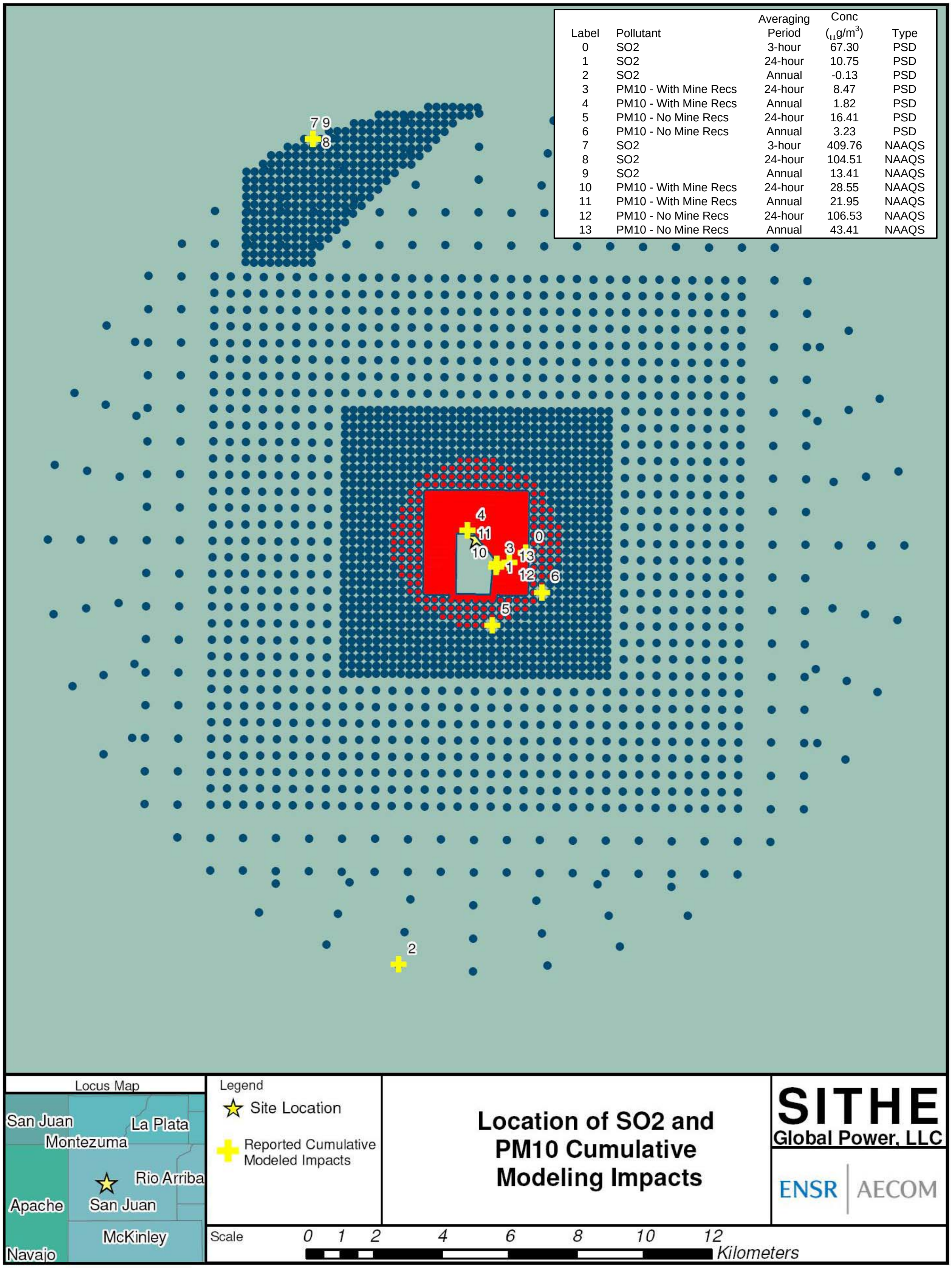


Figure 4-9 Location of PSD and NAAQS Cumulative Modeling Impacts



Label	Pollutant	Averaging Period	Conc ($\mu g/m^3$)	Type
0	SO2	3-hour	67.30	PSD
1	SO2	24-hour	10.75	PSD
2	SO2	Annual	-0.13	PSD
3	PM10 - With Mine Recs	24-hour	8.47	PSD
4	PM10 - With Mine Recs	Annual	1.82	PSD
5	PM10 - No Mine Recs	24-hour	16.41	PSD
6	PM10 - No Mine Recs	Annual	3.23	PSD
7	SO2	3-hour	409.76	NAAQS
8	SO2	24-hour	104.51	NAAQS
9	SO2	Annual	13.41	NAAQS
10	PM10 - With Mine Recs	24-hour	28.55	NAAQS
11	PM10 - With Mine Recs	Annual	21.95	NAAQS
12	PM10 - No Mine Recs	24-hour	106.53	NAAQS
13	PM10 - No Mine Recs	Annual	43.41	NAAQS

5.0 Distant PSD Class II Modeling Procedures and Results

5.1 Overview

CALPUFF was used to assess impacts at distant sensitive Class II areas (beyond 50 kilometers) as requested by the Federal Land Managers (FLMs). These areas are shown in Figure 5-1, and include:

- Aztec Ruins National Monument
- Canyon de Chelly National Monument
- Chaco Culture National Historic Park
- Colorado National Monument
- Cruces Basin Wilderness Area
- Curecanti National Recreation Area
- El Malpais National Monument
- El Morro National Monument
- Glen Canyon National Recreation Area
- Hovenweep National Monument
- Hubbel Trading Post National Historic Site
- Lizard Head Wilderness Area
- Mount Sneffels Wilderness Area
- Natural Bridges National Monument
- Navajo National Monument
- Pecos National Historic Park
- Petroglyph National Monument
- Rainbow Bridge National Monument
- Salinas Pueblo Missions National Monument
- South San Juan Wilderness Area
- Sunset Crater National Monument
- Wupatki National Monument
- Yucca House National Monument
- Zuni-Cibola NHP
- Wilson Mountain Primitive Area
- Uncompahgre Wilderness Area

5.2 Distant PSD Class II Area Analysis

Except where noted below, impacts at these areas were addressed in terms of PSD Class II increment, regional haze, and acidic deposition. For all pollutants and averaging periods impacts at each distant PSD Class II area were assessed using emissions from the main boilers stack alone. The modeling results discussed in this report show the project to have an insignificant modeled increment, so no further modeling was required (Class II significance thresholds are shown in Table 4-1). Since these areas are not Class I designated, regional haze and acidic deposition results are not subject to the FLAG Phase I (2000) procedures. Therefore, the results are provided in this report for informational purposes and are not compared to thresholds that are applicable for a Class I area.

Colorado National Monument, Wilson Mountain Primitive Area, and Uncompahgre Wilderness Area are Class I protected areas for SO_2 PSD increment in Colorado. Therefore, the SO_2 Class I significance thresholds and increments apply to these Class II areas only. Proposed Class I significance thresholds and increment values can also be found in Table 5-1.

Receptor grids for these areas were generated based on the suggestions of John Notar of the NPS and are identical to those used in the May 2004 permit application. Receptor elevations were either selected from a topographic map or calculated using 90-meter spaced Digital Elevation Model (DEM) files. The identified distant PSD Class II areas noted by the Federal Land Managers are all beyond 50 km from the proposed source.

Table 5-1 SO_2 PSD Class I Significant Impact Levels and Increments

Standard	Averaging Time		
	Annual	24-hour	3-hour
SIL	0.1 $\mu g/m^3$	0.2 $\mu g/m^3$	1 $\mu g/m^3$
Increment	2 $\mu g/m^3$	5 $\mu g/m^3$	25

The meteorological data that was used as input to CALPUFF for the distant Class II and near-field Class II modeling featured the same three years of prognostic mesoscale meteorological (MM) data as were used for the PSD Class I analysis. The Class I impacts analysis used several different CALMET grids for various reasons that were specific to the Class I area impact concerns from the NPS. The CALMET output that was used to run CALPUFF to assess impacts at the distant Class II areas is consistent with the 2001-2003 full year 4-km dataset. There is a more detailed description of development of this dataset in the ENSR January 2006 Class I modeling report. The full year 4-km dataset used the following MM5 datasets for the initial guess field (1) 2001 used 36-km EPA MM5, (2) 2002 used 12-km WRAP MM5, and (3) 2003 used 20-km RUC.

Emissions from the main stack at 100% load were modeled in a manner consistent to that used in the Class I modeling assessment. As in the Class I analysis, primary emissions of SO_2, SO_4, NO_X and PM_{10} were considered from the main stack. The primary PM_{10} emissions were speciated according to procedures in recently submitted PSD permit applications for purposes of visibility impact predictions. The National Park Service (NPS) has requested that the PM_{10} be broken down into separate components based on the particles' light scattering properties. Those components are: (1) soils, (2) elemental carbon, and (3) organic aerosols. These components are modeled separately because their light scattering/absorption effectiveness differs. For example, elemental carbon can produce 10 times more visibility degradation than does the "soils" (e.g., ash or "soils") portion of PM_{10} emissions.

The "modeled" soils component of the primary PM_{10} emissions consists of soils plus inorganic aerosols because they are assumed to have similar light scattering properties. Soils are assumed to be 96.3 percent of the filterable PM_{10} (EPA, 2002). The organic aerosols "modeled" component of the primary PM_{10} emissions is assumed to be the condensable portion of PM_{10}. The elemental carbon "modeled" component of the primary PM_{10} emissions is assumed to be 3.7 percent of the filterable PM_{10} (EPA, 2002).

CALPUFF regional haze modeling typically considers primary SO_4 emissions (derived from H_2SO_4). Primary emissions of SO_4 are modeled because calculations of regional haze are sensitive to SO_4, which combine with free atmospheric ammonia to form light-scattering ammonia sulfate fine particles. For this Project, SO_4 was included in the regional haze analysis as a primary pollutant.

In addition to breaking the PM_{10} down into different components based on light scattering properties, the primary PM_{10} emissions were also broken down into different components based on a size distribution. The size distribution is used to more accurately reflect the rate at which the PM_{10} gravitationally settles out of the atmosphere and how differently sized particles affect light scattering/absorption. The size distributions are based on the AP-42, Tables 1.1-5 and 1.1-6. This size distribution is shown in Table 5-2. The filterable PM_{10} emissions are distributed by the applicable size distributions in AP-42, Table 1.1-6. Table 1.1-5 of AP-42 indicates that condensable PM and elemental carbon can be assumed to be < 1.0 micron in diameter. Therefore, the condensable and elemental carbon emissions are assigned to the smallest size category.

CALPUFF was run for the impacts in distant Class II areas using the 100% load SO_2, SO_4 and NO_X emissions in Table 2-2. PM_{10} was modeled with a unit emission rate for each size distribution category found in Table 5-2. The PM_{10} increment results were then assessed by scaling each "size" components unit emission results by the emissions listed in Table 5-3 using the POSTUTIL postprocessor. Likewise, for the regional haze analysis, the POSTUTIL postprocessor was used to scale each "size" components unit emission results based on the emissions listed in Table 5-4 and create the different light scattering components of PM_{10}.

Table 5-2 Size Distribution of Particulate Matter used in CALPUFF Modeling

Aerodynamic Diameter (µm)	Filterable PM[1] (%)	Filterable PM_{10} Only (%)	Condensable PM_{10} Only (%)
>15	3.0		
10 - 15	5.0		
6 - 10	15.0	16.3	
2.5 - 6	24.0	26.1	
1.25 - 2.5	22.0	23.9	
1.0 - 1.25	6.0	6.5	
0.625 - 1.0	11.0	12.0	
0.5 - 0.625	14.0	15.2	100.0
Total	100.0	100.0	100.0

(1) Data obtained from EPA's AP-42, Table 1.1-6 (Baghouse)

Table 5-3 Particle Size Distribution Emission Rate Summary used for the CALPUFF Run to Determine the Maximum PM_{10} Concentrations

Geometric Mass Mean Diameter (µm)	PM_{10} Emissions (g/s) (per Boiler)
	100 % Load
6-10	2.7938
2.5 – 6	4.4702
1.25 – 2.5	4.0976
1.0 – 1.25	1.1175
0.625 – 1.0	2.0488
0.5 – 0.625	19.7432

Table 5-4 Particle Size Distribution Emission Rates used for the Regional Haze Analysis

Geometric Mass Mean Diameter (µm)	Soils (Inorganic) Emissions (g/s)	Organic Emissions (g/s)	Elemental Carbon Emissions (g/s)
6 - 10	2.79	0.00	0.00
2.5 - 6	4.47	0.00	0.00
1.25 - 2.5	3.95	0.00	0.15
1.0 - 1.25	1.08	0.00	0.04
0.625 - 1.0	1.97	0.00	0.08
0.5 - 0.625	2.51	10.28	0.10

Figure 5-1 Distant PSD Class II Areas Considered in the Modeling Analysis

5.3 Distant PSD Class II Results

Results of the PSD Class II increment modeling for these distant areas are provided in Table 5-5. For these Class II areas, there are no impacts above the Class II SILs. The three areas in Colorado where PSD Class I SO_2 increments apply are noted in the table, and the concentrations are below the Class I SILs in these three areas.

For informational purposes, results of the visibility (regional haze) assessment for these areas are provided in Table 5-6 and of the sulfur and nitrogen deposition modeling are provided in Table 5-7.

Results in the second column of Table 5-6 employ the FLAG procedures, while the values in the third column employ the recently proposed “BART” procedure. We provide this information to show that the proposed project will not have an adverse impact on distant PSD Class II areas.

Table 5-5 Distant Class II Areas Highest Modeled PSD Increment Concentrations – (2001-2003)

Class II Area	Highest 3-Year Modeled Concentration ($\mu g/m^3$)					
	NO_X	SO_2			PM_{10}	
	Annual	3-hour	24-hour	Annual	24-hour	Annual
Aztec Ruins Nat. Mon.	0.011	1.638	0.331	0.026	0.117	0.011
Canyon de Chelly Nat. Mon.	0.006	2.708	0.684	0.018	0.246	0.007
Chaco Culture NHP	0.063	3.758	0.842	0.091	0.285	0.032
Colorado Nat. Mon.*	0.002	0.649	0.193	0.007	0.069	0.003
Cruces Basin NWA	0.006	1.031	0.245	0.012	0.086	0.005
Curecanti NRA	0.002	0.629	0.208	0.007	0.054	0.003
El Malpais Nat. Mon.	0.015	1.506	0.494	0.025	0.182	0.010
El Morro Nat. Mon.	0.006	1.225	0.355	0.010	0.128	0.004
Glen Canyon NRA	0.007	1.300	0.430	0.020	0.163	0.008
Hovenweep Nat. Mon.	0.007	1.181	0.339	0.024	0.158	0.010
Hubbel Trading Post NHS	0.002	0.575	0.167	0.007	0.067	0.003
Lizard Head NWA	0.004	0.981	0.263	0.011	0.085	0.004
Mount Sneffels NWA	0.003	0.755	0.158	0.008	0.054	0.003
Natural Bridges Nat. Mon.	0.004	0.907	0.272	0.013	0.107	0.005
Navajo Nat. Mon.	0.001	0.584	0.233	0.005	0.090	0.002
Pecos NHP	0.003	0.292	0.130	0.008	0.044	0.003
Petroglyph Nat. Mon.	0.011	1.130	0.255	0.023	0.119	0.009
Rainbow Bridge Nat. Mon.	0.001	0.508	0.130	0.004	0.070	0.002
Salinas Pueblo Missions Nat. Mon.	0.004	0.455	0.143	0.009	0.059	0.004
South San Juan NWA	0.008	1.164	0.338	0.014	0.116	0.006
Sunset Crater Nat. Mon.	0.000	0.112	0.051	0.001	0.026	0.001
Uncompahgre NWA*	0.002	0.532	0.155	0.007	0.046	0.003
Wilson Mountain Primitive Area*	0.004	0.848	0.181	0.010	0.063	0.004
Wupatki Nat. Mon.	0.000	0.142	0.062	0.002	0.031	0.001
Yucca House Nat. Mon.	0.007	1.193	0.296	0.021	0.128	0.009
Zuni-Cibola NHP	0.004	1.045	0.262	0.009	0.112	0.004

*** Subject under Colorado regulation to Class I SO_2 increment protection**

Table 5-6 Distant Class II Areas Regional Haze Impact Analysis (2001-2003)

Class II Area	Highest 3-Year Percent (%) Extinction Change	
	FLAG Procedure	Alternative "BART" Procedure (Highest 98th Percentage Value)
Aztec Ruins Nat. Mon.	9.4	3.1
Canyon de Chelly Nat. Mon.	21.6	4.9
Chaco Culture NHP	14.7	6.6
Colorado Nat. Mon.	7.7	2.5
Cruces Basin NWA	6.7	2.2
Curecanti NRA	5.7	1.3
El Malpais Nat. Mon.	11.0	5.4
El Morro Nat. Mon.	9.1	3.1
Glen Canyon NRA	15.2	5.9
Hovenweep Nat. Mon.	20.6	6.7
Hubbel Trading Post NHS	9.2	2.8
Lizard Head NWA	12.7	2.2
Mount Sneffels NWA	7.7	1.6
Natural Bridges Nat. Mon.	8.1	3.8
Navajo Nat. Mon.	13.1	2.6
Pecos NHP	3.7	1.3
Petroglyph Nat. Mon.	9.9	3.2
Rainbow Bridge Nat. Mon.	5.7	1.8
Salinas Pueblo Missions Nat. Mon.	5.6	1.9
South San Juan NWA	8.2	2.6
Sunset Crater Nat. Mon.	4.0	0.8
Uncompahgre NWA	7.1	1.6
Wilson Mountain Primitive Area	7.8	1.8
Wupatki Nat. Mon.	4.3	1.0
Yucca House Nat. Mon.	13.3	3.3
Zuni-Cibola NHP	10.3	2.5

MVISBK=2, RHMAX=95%, 10% ranked lowest background extinction

Table 5-7 Distant Class II Areas Maximum Annual Average Deposition (2001-2003)

PSD Class II Area	3-Year Highest Annual Modeled Deposition (kg/ha/yr)	
	Nitrogen	**Sulfur**
Aztec Ruins Nat. Mon.	0.011	0.027
Canyon de Chelly Nat. Mon.	0.006	0.016
Chaco Culture NHP	0.021	0.047
Colorado Nat. Mon.	0.004	0.008
Cruces Basin NWA	0.005	0.010
Curecanti NRA	0.004	0.009
El Malpais Nat. Mon.	0.007	0.015
El Morro Nat. Mon.	0.004	0.007
Glen Canyon NRA	0.005	0.012
Hovenweep Nat. Mon.	0.006	0.016
Hubbel Trading Post NHS	0.003	0.007
Lizard Head NWA	0.006	0.012
Mount Sneffels NWA	0.005	0.009
Natural Bridges Nat. Mon.	0.004	0.009
Navajo Nat. Mon.	0.002	0.004
Pecos NHP	0.003	0.008
Petroglyph Nat. Mon.	0.006	0.014
Rainbow Bridge Nat. Mon.	0.003	0.005
Salinas Pueblo Missions Nat. Mon.	0.003	0.006
South San Juan NWA	0.006	0.012
Sunset Crater Nat. Mon.	0.001	0.001
Uncompahgre NWA	0.004	0.009
Wilson Mountain Primitive Area	0.005	0.011
Wupatki Nat. Mon.	0.001	0.001
Yucca House Nat. Mon.	0.008	0.020
Zuni-Cibola NHP	0.004	0.007

6.0 Additional Impact Analyses

The PSD regulation requires that additional analyses be performed when assessing the impacts of a proposed project. These additional analyses include an evaluation of local visibility impacts, the potential impacts caused by secondary emissions from growth caused by the project and an analysis of impacts to soils and vegetation that have economic value. These analyses are provided in this section.

6.1 Local Visibility Impairment

There is no identified scenic vista within 50 km of the project site. A local plume blight analysis was conducted for a hypothetical sensitive area located 50 km from the project site, using the visibility screening model, VISCREEN. The VISCREEN model is recommended by the EPA as a screening tool to determine the visibility impacts for source-observer distances of up to 50 km.

The VISCREEN model was applied with Level-1 defaults and the expected emissions from the main stack. The source-observer distance was assumed to be 50 km. A background visual range of 250 km was used for the VISCREEN analysis. This visual range corresponds to the natural background extinction for the nearby Msea Verde National Park of 15.6 Mm^{-1} as listed in the *Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report* (December 2000). The following equation was used to calculate the visual range from the extinction at Mesa Verde:

$$V_r = 3.912 \times 1000 / \beta_{ext}$$

where: β_{ext} = extinction in unit of Mm^{-1}

The expected total emissions from the main stack for Non-sulfate PM_{10} (884 TPY), NO_X (3,395 TPY), Primary H_2SO_4 (226 TPY), and Soot (21 TPY) were input to VISCREEN. Total primary PM_{10} was adjusted as to not double count the affect of primary sulfate (SO_4), a portion of condensable PM_{10}, and soot.

Meteorological input included a wind speed of 2 m/s and stability class of 4. The value of 2 m/s is used rather than the Level-1 default of 1 m/s because 12 hours of transport at 1 m/s does not reach 50 km. A stability class of 4 is used rather than the Level-1 default of 6 because 4 is representative of the least convective stability class found during the day.

The maximum VISCREEN results inside the Class I area for color difference index (ΔE) was 3.10 against sky and 8.96 against terrain. The maximum VISCREEN result inside the Class I area for contrast ($|C|$) was 0.069 against sky and 0.079 against terrain. The maximum VISCREEN results outside the Class I area for color difference index (ΔE) was 38.04 against sky and 35.06 against terrain. The maximum VISCREEN result inside the Class I area for contrast ($|C|$) was 0.915 against sky and 0.431 against terrain. Since there are no thresholds for PSD Class II areas, these values are provided for informational purposes.

6.2 Growth Analysis

A growth analysis examines the potential emissions from secondary sources associated with the proposed project. While these activities are not directly involved in project operation, the emissions can reasonably be expected to occur. For the proposed Desert Rock Energy Facility, secondary emissions will be associated with:

- coal processing and handling activities associated with the coal supply,
- construction activities, and
- the project workforce.

The Desert Rock Energy Facility is proposing to locate in San Juan County, New Mexico. During construction, the project is expected to employ about 800 workers, although the workforce may be up to 3,000 workers during peak construction periods. After start of operations, there will be approximately 200-225 employees.

The workers for the plant (both construction and operations) are primarily expected to come from San Juan County and adjoining McKinley County. It is expected that approximately 10% of the workforce will come from rural areas within the Navajo Nation. Most workers (~60%) will commute approximately 30 miles from the Farmington and Shiprock areas (San Juan County) while the remainder will commute approximately 75 miles from Gallup (McKinley County) and Window Rock (Apache County, Arizona). The Navajo Nation requires preferred employment of local people, hence many of the workers are expected to come from rural areas in the Navajo Nation.

The estimated 2002 population of San Juan and McKinley counties was 120,400 and 74,000 persons. The basic construction workforce of 800 persons is less than 0.4% of the population from which the labor pool will be drawn. Over the past several years, San Juan and McKinley Counties have consistently had unemployment above the statewide average. From published New Mexico Department of Labor statistics, the unemployment rate in San Juan and McKinley Counties in 2002 was 6.7% (3,500 persons) and 6.1% (1,600 persons), respectively, compared with the statewide total of 5.4%. While only a portion of the unemployed persons in the two counties would be qualified for construction or operation jobs at the power plant, the number of unemployed workers in the two counties in 2002 is slightly less than two times the 3,000 workers on site during the peak periods and more than 6 times the daily average of 800 workers during most of the construction period. As many of the construction workers during peak periods will be transient workers hired or brought in by subcontractors, they may cause local short-term demand for services in area hotels and restaurants but will not contribute to permanent growth in the area due to their transient nature. Negligible growth is expected for the operation phase given the small number of operational workers (225) in a two-county region of nearly 200,000 persons.

Based on current unemployment levels, the requirement by the Navajo Nation for preferred employment for local persons, and the expectation that a significant number of workers will come from the existing employment pool in the area, population growth associated with the proposed project is expected to be small.

Consequently, secondary emission increases associated with the project workforce will be due primarily to worker commuter trips. As approximately 30% of the workers will commute from Gallup (approximately 75 miles) and 60% from Shiprock and Farmington (approximately 25 miles), an average commute on the order of 40 miles is a reasonable estimate. For construction, assuming 800 employee commute trips per day of 40 miles each way, the typical daily commute vehicle miles traveled (VMT) will be approximately 64,000 vehicle-miles per day. PM_{10}, VOC and NO_x from this traffic might be on the order of 15 TPY for the three-year construction period. For operations, the VMT will be much lower, less than approximately 18,000 vehicle-miles per day, or about 5 TPY of PM_{10}, VOC and NO_X.

Given the rural nature of the two-county region, vehicle emissions associated with the project workforce travel will likely be spread out over a substantial part of the two-county area, an area of over 8,500 square miles. Consequently, the impacts of any emissions will not be concentrated but rather will be dispersed throughout a large area, thus limiting local impacts in the largely rural counties.

The secondary emissions associated with the project construction are not expected to be substantial when compared to direct emissions during normal operation of the facility. As discussed below, the emissions associated with the coal supply system will occur during plant operation and will be primarily due to coal processing, mining, and road dust from coal haul truck operation on unpaved roads. These emissions have been modeled in the cumulative PM_{10} assessment described above. There will be little new growth in the area due to the small work force (200-225 employees) expected during plant operation. The emissions associated with the workforce will be primarily the result of motor vehicle exhaust emissions associated with the commute of workers to and from the plant site.

The emissions associated with the coal operation are expected to be localized in the immediate area of the mine. The emissions due to worker commute are expected to be distributed over a two-county area of San Juan and McKinley counties with limited impact at any given location. Based on this analysis, we conclude that there will be little impact beyond the local area surrounding the Desert Rock Energy Facility due to secondary emission sources from the project workforce.

6.3 Impacts on Soils and Vegetation

PSD regulations require analysis of air quality impacts on sensitive vegetation types, with significant commercial or recreational value, and sensitive types of soil. Evaluation of impacts on sensitive vegetation were performed by comparing the predicted impacts attributable to the Project with the screening levels presented in *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals* (EPA 1980).

The results of this analysis are given in Table 6-1. As shown in the table, all impacts are modeled to be well below the screening levels. Most of the designated vegetation screening levels are equivalent to or less stringent than the NAAQS and/or PSD increments, therefore satisfaction of NAAQS and PSD increments assures that sensitive vegetation will not be impacted.

It is worth noting that the impact of all proposed sources were included in the soil and vegetation analysis. For short-term averaging periods the impacts are dominated by the low-level intermittent sources. Specifically for the 4-hour NO_2 impact, the impacts from low-level diesel source contribute substantially to this modeled concentration. These low-level diesel sources are not designed to have operated that often, in fact they may only operate 1 hour per week to maintain warranty testing requirements. These sources will likely only be used in an emergency situations while the main boilers are not operating.

Table 6-1 Screening Concentrations for Soils and Vegetation

Pollutant	Averaging Period	Screening Concentration ($\mu g/m^3$)	Predicted Concentration ($\mu g/m^3$)
SO_2	1-Hour	917	801.48
	3-Hour	786	271.18
	Annual	18	0.41
NO_2 (1)	4-Hour	3,760	3400.73
	1-Month (2)	564	32.84
	Annual	94	0.56
CO	Weekly (3)	1,800,000	465.16

Source: "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals". EPA 450/2-81-078, December 1980

(1) 75% Conversion from NO_X to NO_2 assumed for 4-hour avg .

(2) Modeled with the 120-hour Averaging Time

(3) 3-hour averaging period conservatively used.

6.4 Impacts on Ozone Concentrations

The New Mexico Environmental Department has recently conducted a comprehensive photochemical modeling study (using CAMx) of the projected ozone concentrations in the Farmington, NM area. The 2004 study, found at www.nmenv.state.nm.us/ozonetf, included new sources, such as the proposed Steag project. The results of the study indicated that:

- Compliance with the 8-hour ozone standard is demonstrated for 2007 and 2012
- Ozone concentrations are expected to decrease slightly during the period leading up to 2012
- Background ozone (transported from long distances) is an important contributor to elevated ozone levels
- Biogenic emissions contribute more to ozone formation that anthropogenic emissions
- Source categories of electric utilities, oil and gas sources, area sources, and mobile sources each contribute about equally to the formation of ozone in the Farmington area.

Based on the results of this study, which accounted for the Project emissions in the region, it can be concluded that the Desert Rock Energy Facility will not cause or contribute to an exceedance of the ozone AAQS in the region.

6.5 Summary of PSD Class II Air Quality Modeling Results

Dispersion modeling of the air quality impacts of the proposed Desert Rock Energy Facility on PSD Class II areas has been completed. The results are summarized below.

- The Project impacts are above PSD Class II significance levels for a limited area around the facility (about 11 km for SO_2 and 1.7 km for PM_{10}). The project has insignificant impacts for CO and NO_x.
- The peak impacts from the facility are located very close to the fenceline (within 1 km in most cases). These impacts are likely due to the emergency generator or auxiliary boilers that do not run continuously.
- The PSD increment consumption due to the facility emissions is well within PSD Class II increments. The cumulative modeling analysis shows compliance with PSD Class II increments and the NAAQS.
- The SO_2 3-hour and 24-hour impacts are 19% and 12% of the PSD increments and are located between 1.0 km and 1.5 km from the main stack. The PM_{10} 24-hour and annual impacts are 29% and 12% of the PSD increments and are located within 1.0 km of the main stack.
- The SO_2 3-hour and 24-hour impacts are 16% and 15% of the NAAQS and are located 11 km from the main stack. Distant impacts from the Four Corners Power Plant and the San Juan Generating Station are likely contributors to this total. The PM_{10} 24-hour and annual impacts are 32% and 39% of the NAAQS and are located within 1 km of the main stack.
- There are no modeled significant impacts from the proposed project in areas beyond the Navajo Nation, including New Mexico lands and the Ute Mountain range to the north.
- Impacts on numerous distant PSD Class II areas (located beyond 50 km) show increment consumption below significance limits. Steag has provided regional haze and deposition results for informational purposes, since PSD Class I limits are not applicable in Class II areas. No further modeling analysis for these distant areas is needed.
- The results of the additional impacts analysis indicate no predicted impacts above EPA screening levels for soils and vegetation.

In conclusion, the potential effects on air quality due to emissions from the proposed Desert Rock Energy Facility, in conjunction with the nearby source emissions, are expected to result in predicted concentrations in Class II areas that are in compliance with PSD and NAAQS limits.

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